E

HALL & CARPENTER,

PHILADELPHIA.

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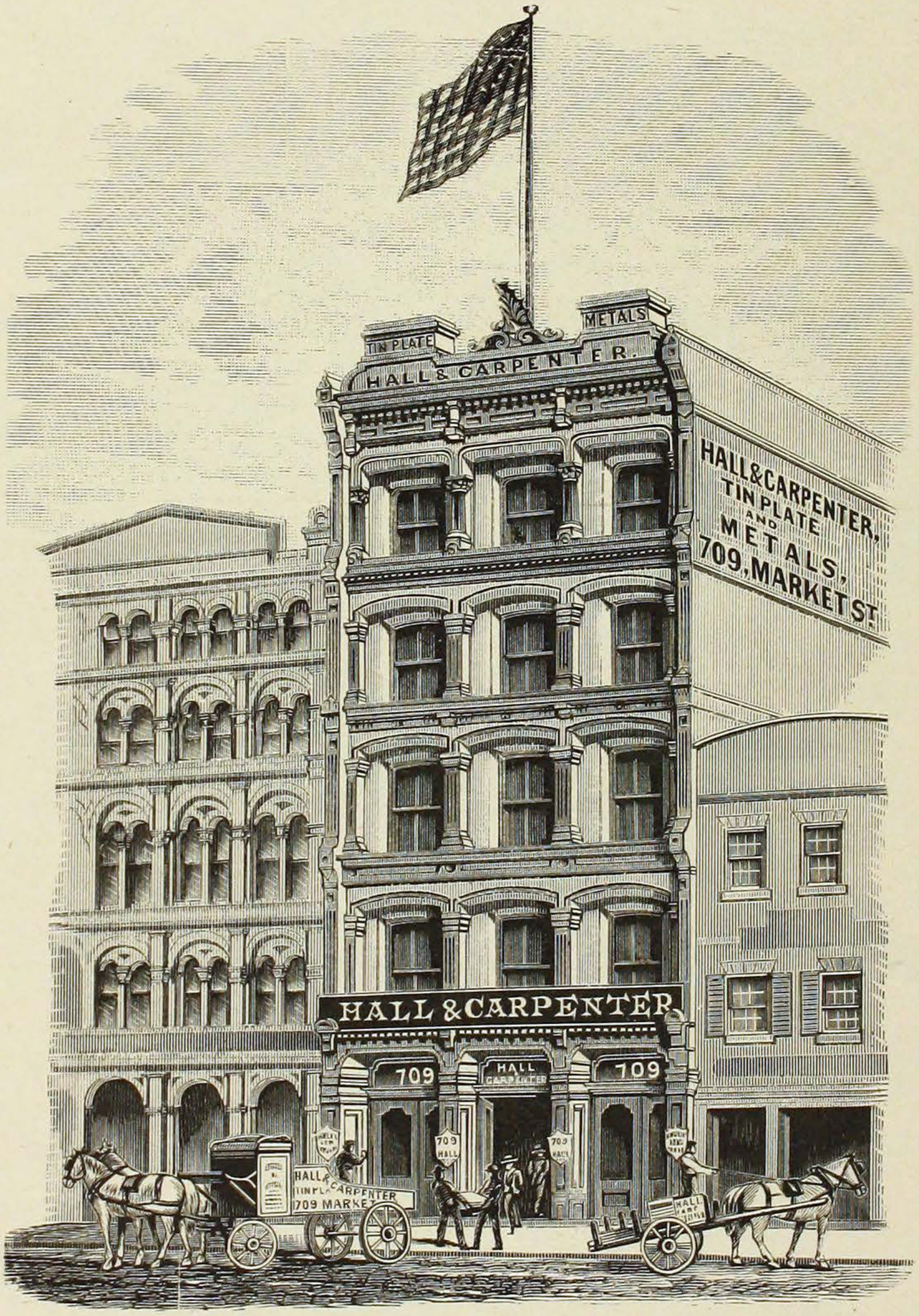
Mr. A. C. Albrecht

OCT 30 1902

HALL & CARPENTER,

IMPORTERS OF

TIN PLATE AND METALS



No. 709 MARKET STREET,

PHILADELPHIA.

HALL & CARPENTER.

CATALOGUE

OF

TINSMITHS'

Tools and Machines

DEEP STAMPED WARE

COMMON STAMPED WARE, JAPANNED WARE

AND

MISCELLANEOUS GOODS.

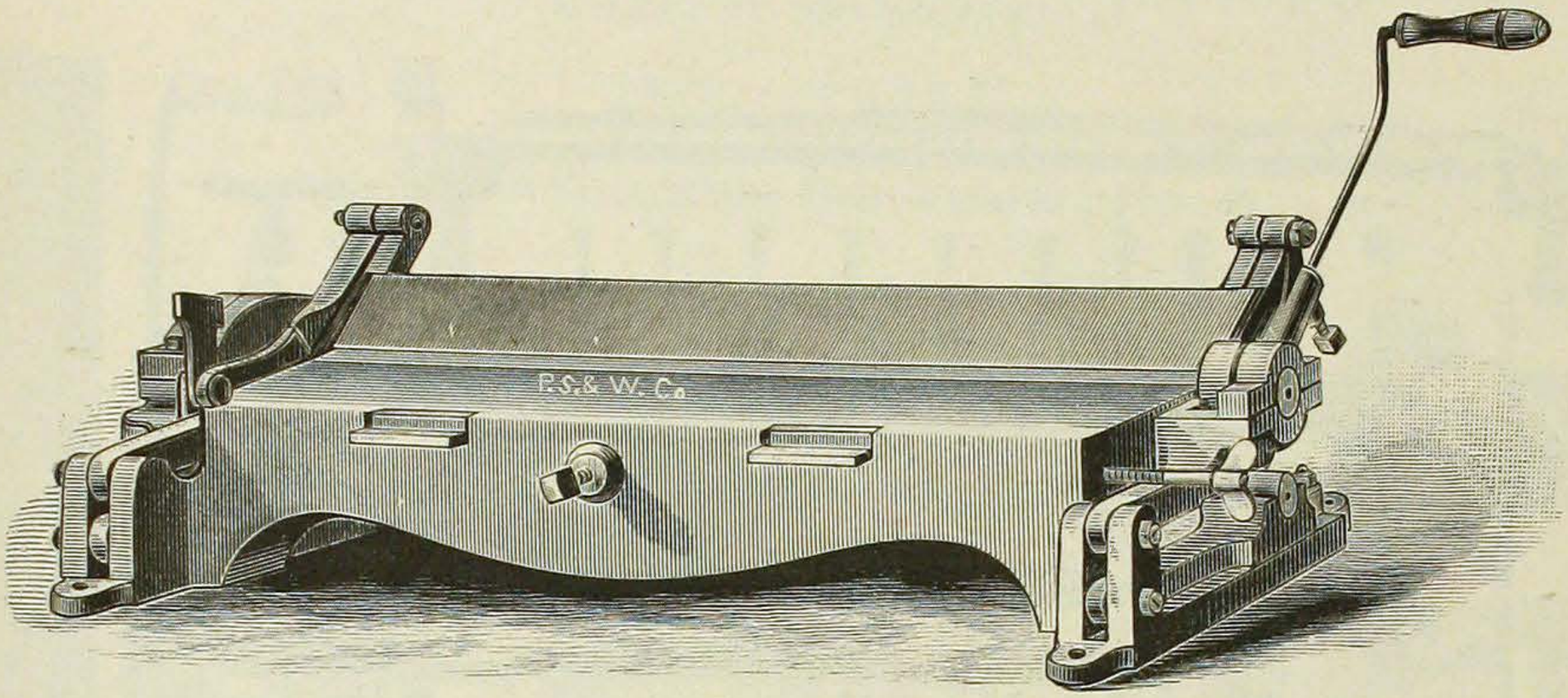
PHILADELPHIA,
1886.

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TINSMITHS' TOOLS AND MACHINES.

TIN FOLDING MACHINES.



Stow's Patent Adjustable Bar Folder.

WILL TURN LOCKS FROM ⅛ TO ¾ OF AN INCH IN WIDTH.

This Machine will form square joints or angles, turn a narrow or wide lock, turn a round edge for wiring, and form locks on very heavy plate, with ease.

All the parts are interchangeable, like a Waltham Watch; that is, any part of one Machine is exactly like the same part in another.

To make it easy to order any piece, all the parts are lettered or numbered, and it is only necessary to refer to the letter or number on the defective part corresponding with the representations on the following pages—always giving the number of the Machine for which the part is wanted.

The above cut represents the Folding Bar raised at an angle as in process of folding a sheet of metal.

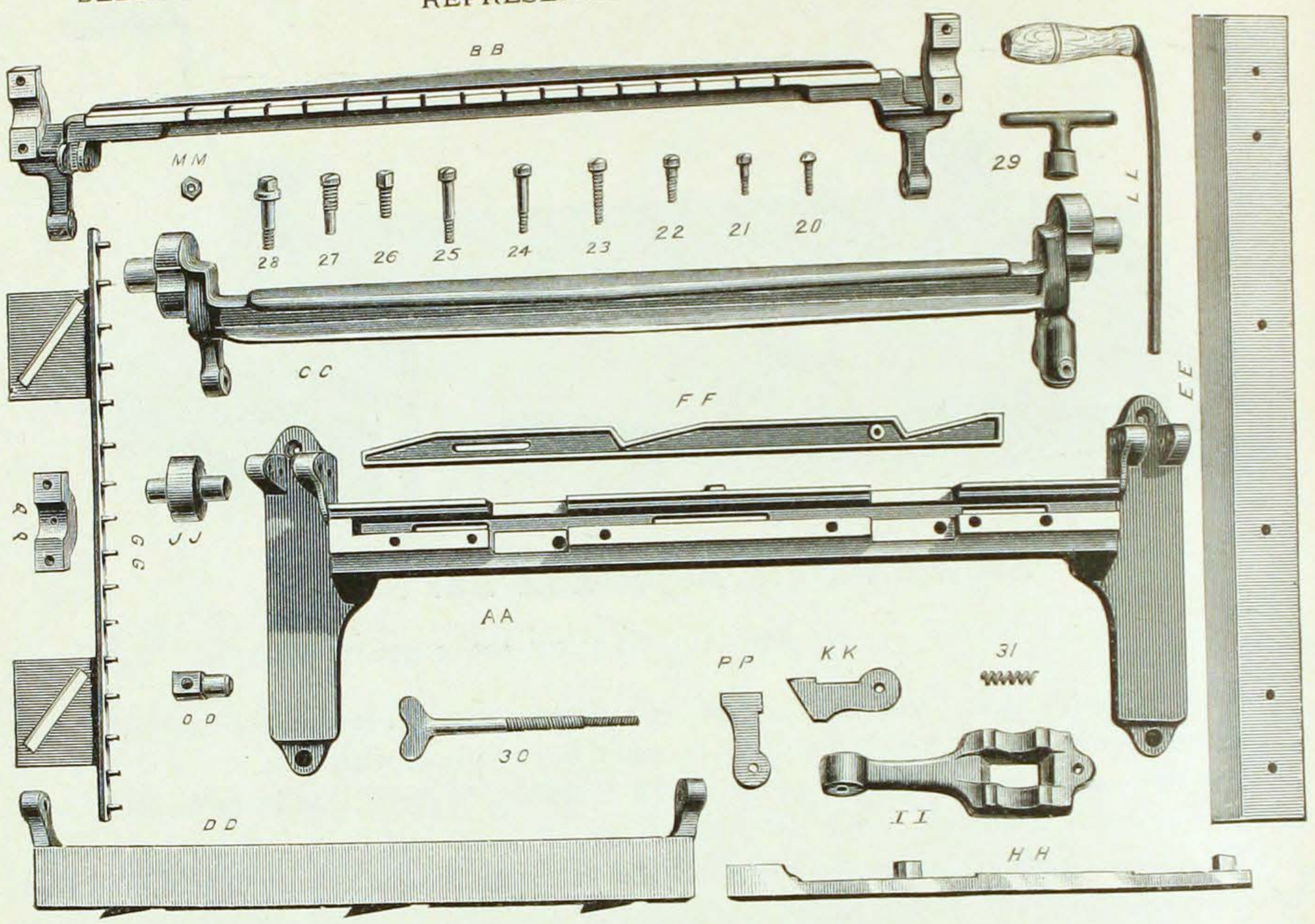
NOTE.—These Folders as heretofore made were numbered 00, 0, 01, 02. Peck, Stow & Wilcox Co. have made many improvements in the Machine, and have somewhat changed its style, and hereafter shall send out the Machines as described below, in place of those heretofore made. But as many thousands of these Machines are in use, we give on page 7 the parts and prices of the old Machines, that parties having them in use can obtain repairs for the same. Do not confound the parts of the new Machine on page 6 with the parts of the old 0 Folder represented on page 7.

No. 50.	17 inches, for Tin, same as old No. 00, will turn locks from ⅛ to ⅜ .	$25.00
No. 52.	20 inches, for Tin, same as old No. 0, will turn locks from ⅛ to ¼ .	30.00
No. 54.	30 inches, for Tin, same as old No. 01, will turn locks from ⅛ to ¼ .	40.00
No. 56.	42 inches, for Tin and Sheet Iron, will turn edges from $\frac{3}{16}$ to $1\frac{5}{8}$ on No. 22 Iron, but will not form open and close locks as the others .	80.00

REPRESENTATION AND PRICES
OF THE

INTERCHANGEABLE PARTS

BELONGING TO STOW'S ADJUSTABLE BAR FOLDERS, NOS. 52 AND 54 AS REPRESENTED ON PAGE 5.



For No. 52 Folder.

AA.	Frame	$6.00	II.	Shoe	$0.50
BB.	Jaw	4.00	JJ.	Friction Roller	.50
CC.	Bar	4.00	KK.	Stop	.25
DD.	Wing for Bar	3.00	LL.	Handle	.40
EE.	Blade	4.00	MM.	Set Nut for Screw No. 23	.25
FF.	Wedge	.50	OO.	Nut for Gauge Screw	.75
GG.	Gauge	3.50	PP.	Stop	.25
HH.	Slide	1.00	QQ.	Cap	.50

Screws.

No. 20.	Wedge Screw	$0.25	No. 26.	Handle and Gauge Set Screw,	$0.10
" 21.	Stop Screw	.25	" 27.	Wing Screw	.25
" 22.	Cap Screw	.25	" 28.	Wedge Screw	.25
" 23.	Shoe set Screw	.25	" 29.	Wrench	.10
" 24.	Blade Screw	.25	" 30.	Gauge Screw	.50
" 25.	Frame Screw	.25	" 31.	Gauge Springs per pair,	.15

For No. 54 Folder.

AA.	Frame	$7.00	DD.	Wing for Bar	$4.00
BB.	Jaw	5.00	EE.	Blade	5.00
CC.	Bar	5.00	GG.	Gauge	3.50

Other parts same as No. 52 Folder.

REPRESENTATIONS AND PRICES

OF THE

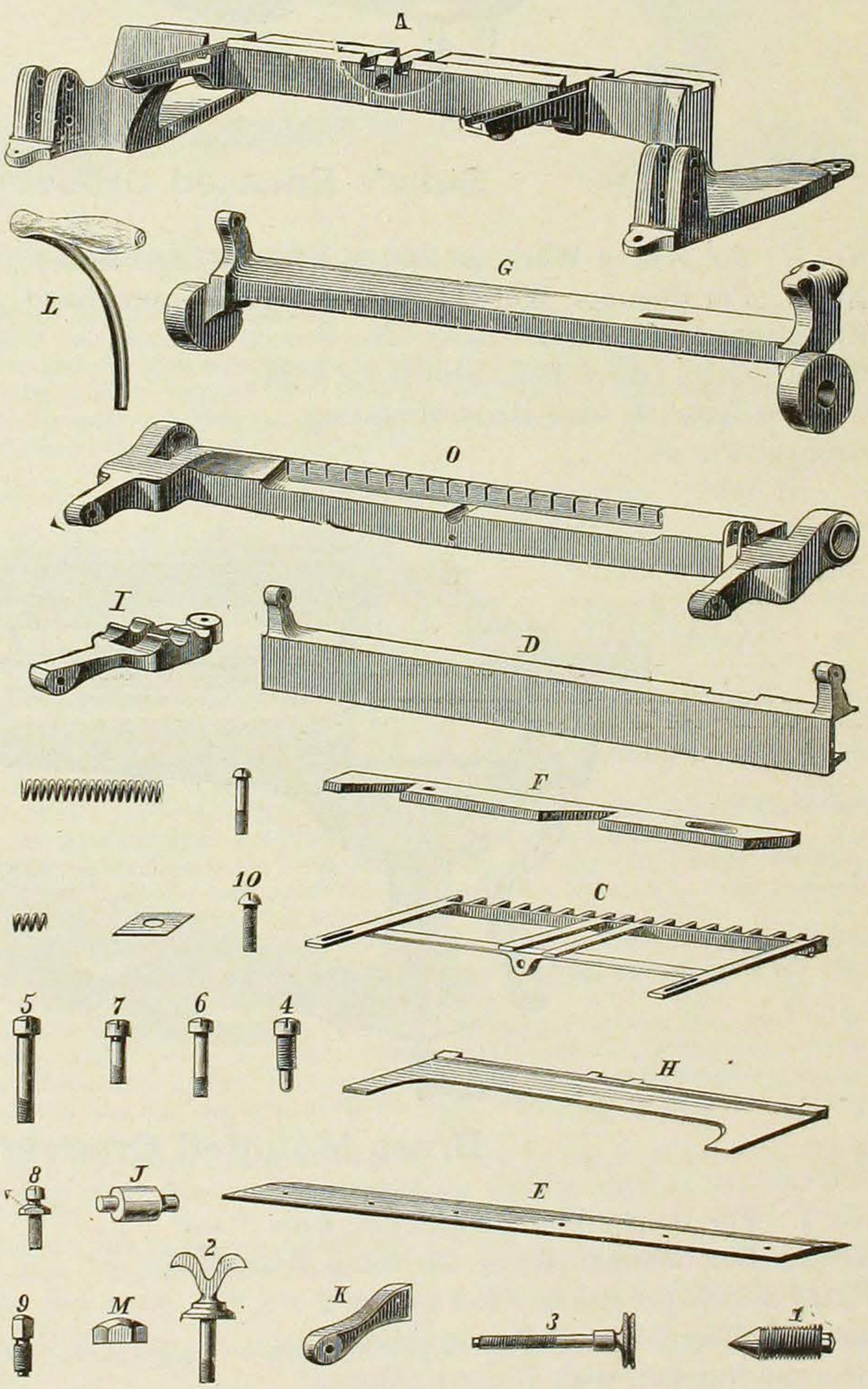
INTERCHANGEABLE PARTS

BELONGING TO

Stow's Adjustable Bar Folder, No. 0,

AS FORMERLY MADE.

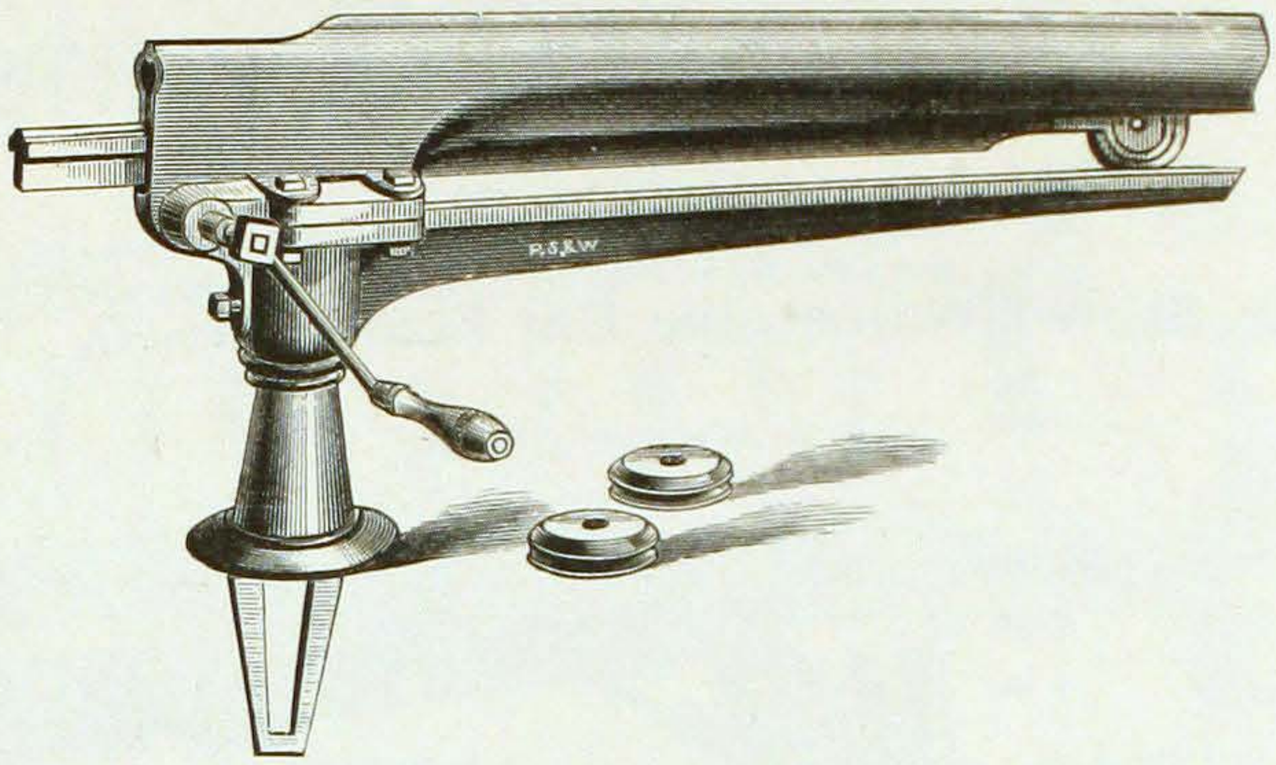
A.	Frame . . .	$6.00
B.	Griping Jaw .	4.00
C.	Folding Bar .	4.00
D.	Wing of Folding Bar . . .	3.00
E.	Folding Plate .	5.00
F.	Adjusting Wedge for Folding Bar,	.50
G.	Gauge . . .	3.50
H.	Gauge Cap . .	.50
I.	Bed of Friction Rollers . .	.50
J.	Friction Rollers,	.50
K.	Stop . . .	.25
L.	Lever . . .	.40
M.	Set Nut for Screw No. 1 . .	.25
N.	Set Nut for Screw No. 8 . .	.25
	The Small Spring is used under the Gauge,	.20



SCREWS.

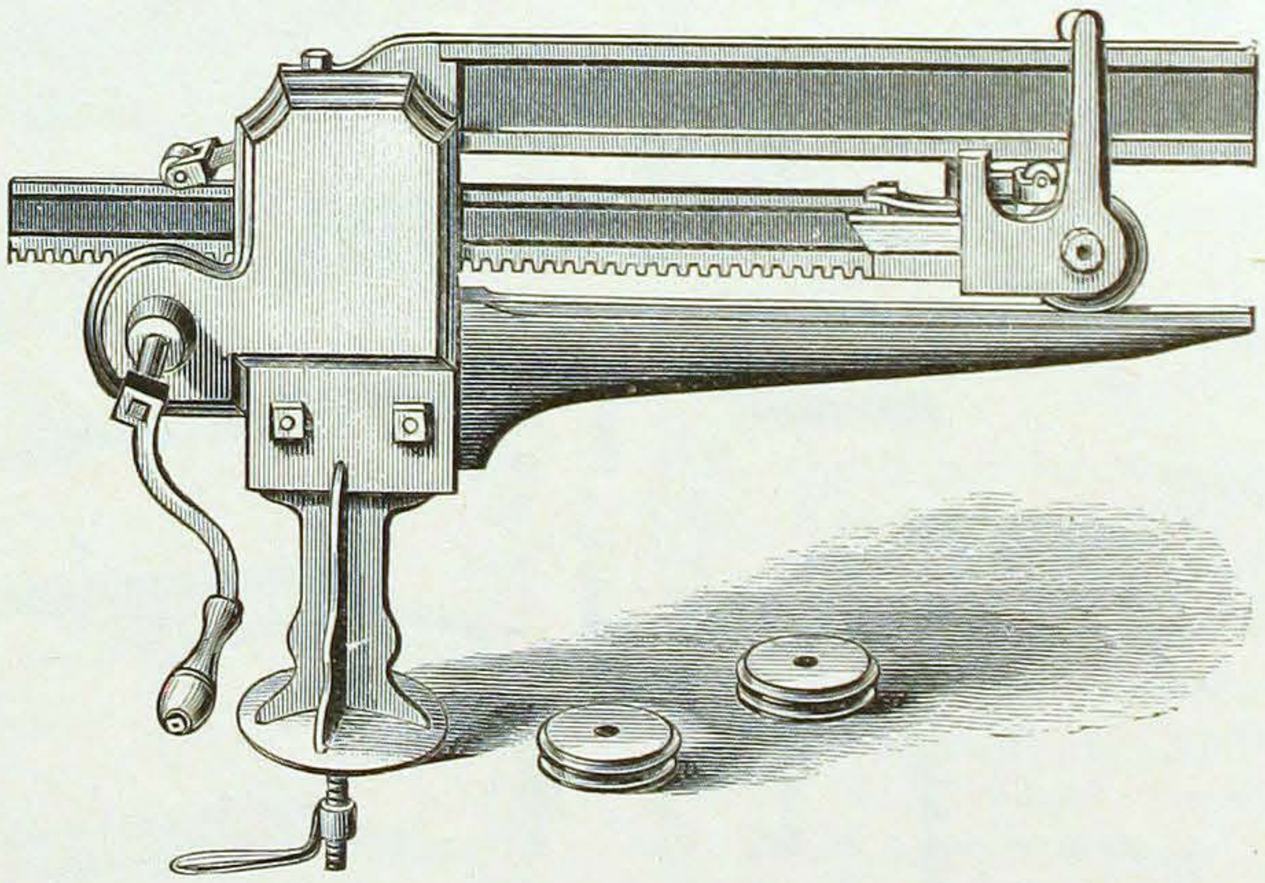
No. 1. Pivot Screw, .	$0.50
Nos. 2 and 10. Wedge Screws, each,	.25
No. 3. Gauge Screw .	.50
" 4. Wing Screw .	.25
" 5. Griping Jaw Screw . ..	.25
" 6. Plate Screw .	.25
" 7. Gauge Cap and Stop Screw .	.25
" 8. Stop Screw for Bed of Fric- Roller . .	.25
" 9. Lever Set Screw,	.10

GROOVING MACHINES.



Stow's Encased Groover.

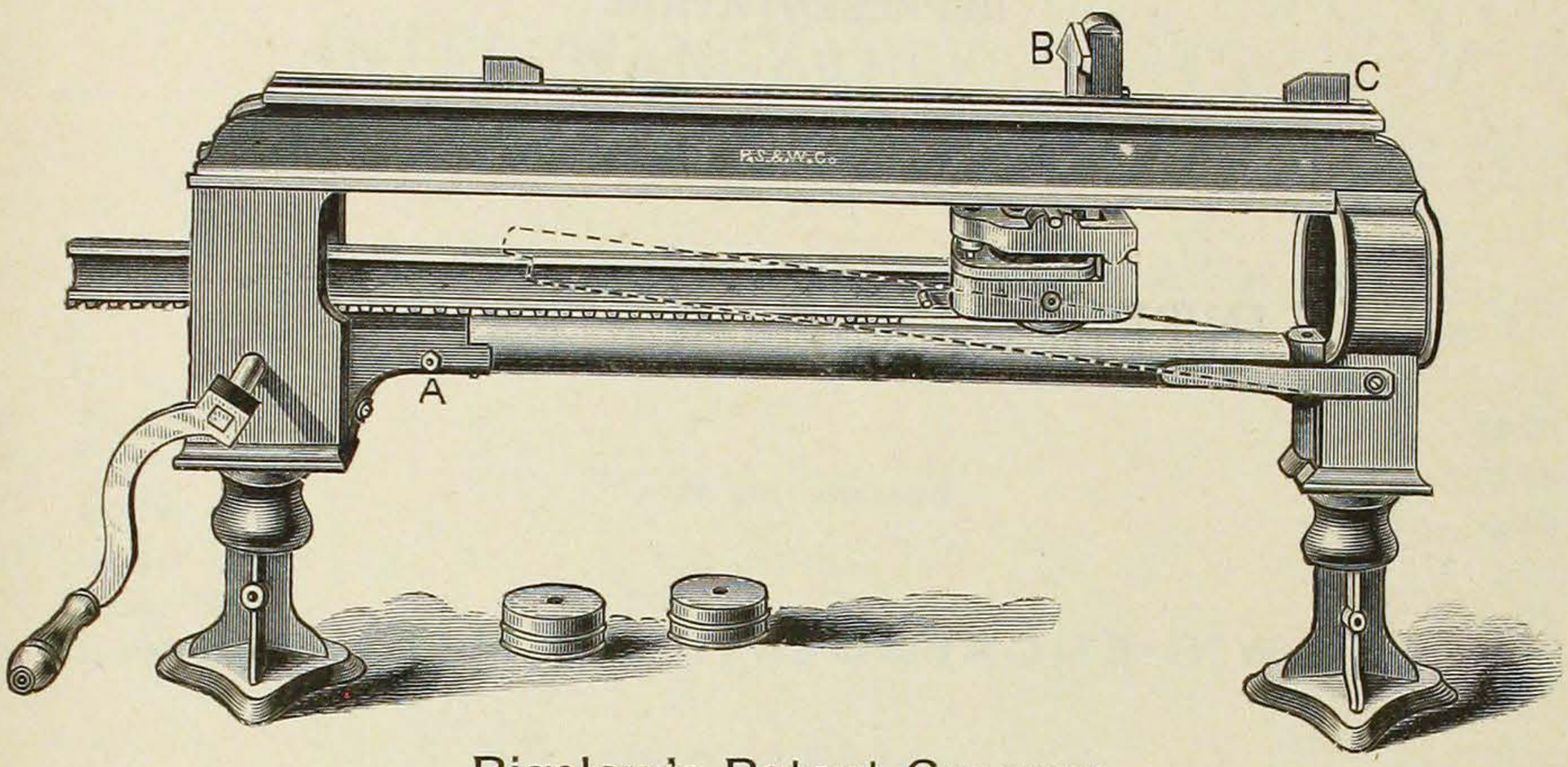
No. 1.	For Heavy Work, 20 inches, with Rotary Stand		$13.50
No. 2.	For Common Work, 17 inches, with Rotary Stand		11.00
Extra Stands for either No. 1 or No. 2		each	.75
Extra Rollers (three Rolls constitute a set)		each	.75
Groover Ratchet, with Brass Mounting			2.50
Groover Pinion			.50



Brass Mounted Groover.

No. 1.	For Heavy Work, 20 inches, with Stand		$13.50
No. 2.	For Common Work, 17 inches, with Stand		11.00
Extra Stands for either No. 1 or No. 2		each	.75
Extra Rollers (three Rolls constitute a set)		each	.75
Groover Ratchet, with Brass Mounting			3.25

GROOVING MACHINES.



Bigelow's Patent Groover.

This Machine is admirably adapted to both grooving and flattening the seam at one operation. The grooving bar opens automatically at A, whenever the grooving roll passes that point, thus enabling all cylinders to be easily removed. C is made to slide in a groove in the upper part of the frame, and whenever B passes that point the grooving roll is changed to a seaming roll, which flattens the seam in the backward motion, thus enabling the operator to adjust the Machine for short lengths of work, and avoiding the necessity of running the rolls the entire length of the bar.

No. 1. For Tin and Sheet-Iron, 30 inches, complete, with Standards . $40.00
No. 2. For Tin and Sheet-Iron, 36 inches, complete, with Standards . 50.00

STOW'S PATENT ENCASED MACHINES.

FOR TINSMITHS, WITH ADJUSTABLE BOXES AND DUPLICATE PARTS.

These Machines, having from their first introduction met with unparalleled success, are now so well known and so generally used that they need only a brief description.

They are the only Tinners' Machines made with the different parts uniform and interchangeable: that is, the corresponding parts of the same Machine are precisely alike, and all are perfect.

All parts of each Machine are stamped with a letter or figure. If any part fails, all that is necessary is to write to us, giving the name of the Machine cast upon the case, and the letter or number stamped upon the part, and a duplicate can be forwarded by mail or express.

The form of the Machine is such that the gear is encased so as to keep it free from dirt. The boxes are well fitted, and oil-holes are drilled. The journals are long, to prevent wearing, and all parts are constructed of the best materials, and with the most thorough workmanship.

An adjustable box is used with each machine, by means of which the upper faces can be moved backward or forward to accommodate different thicknesses of tin, or to compensate for the wearing of the journals.

In adjusting the faces by means of this box it is only necessary to loosen the screw in the clasp nut H, and turn H backward or forward, as the case may require, until the face is brought to the desired place, when H should be fastened by tightening the screw No. 5.

When the boxes under the lower shaft wear down, they can be raised by means of the screw No. 3 under the frame A. All the other parts of the Machine are substantially like the common ones, and will be understood by all Tinners.

The Machines can be readily taken apart by taking out the Screw No. 2.

Please bear in mind that all these Machines are warranted. Each one is carefully inspected before leaving our factory, and, should any part break, with fair usage, in consequence of undetected flaws in the steel, it will be replaced at our expense.

We give on page 10, cuts of the different parts of the Wiring Machine, with the letter or figure, by which each part should be ordered.

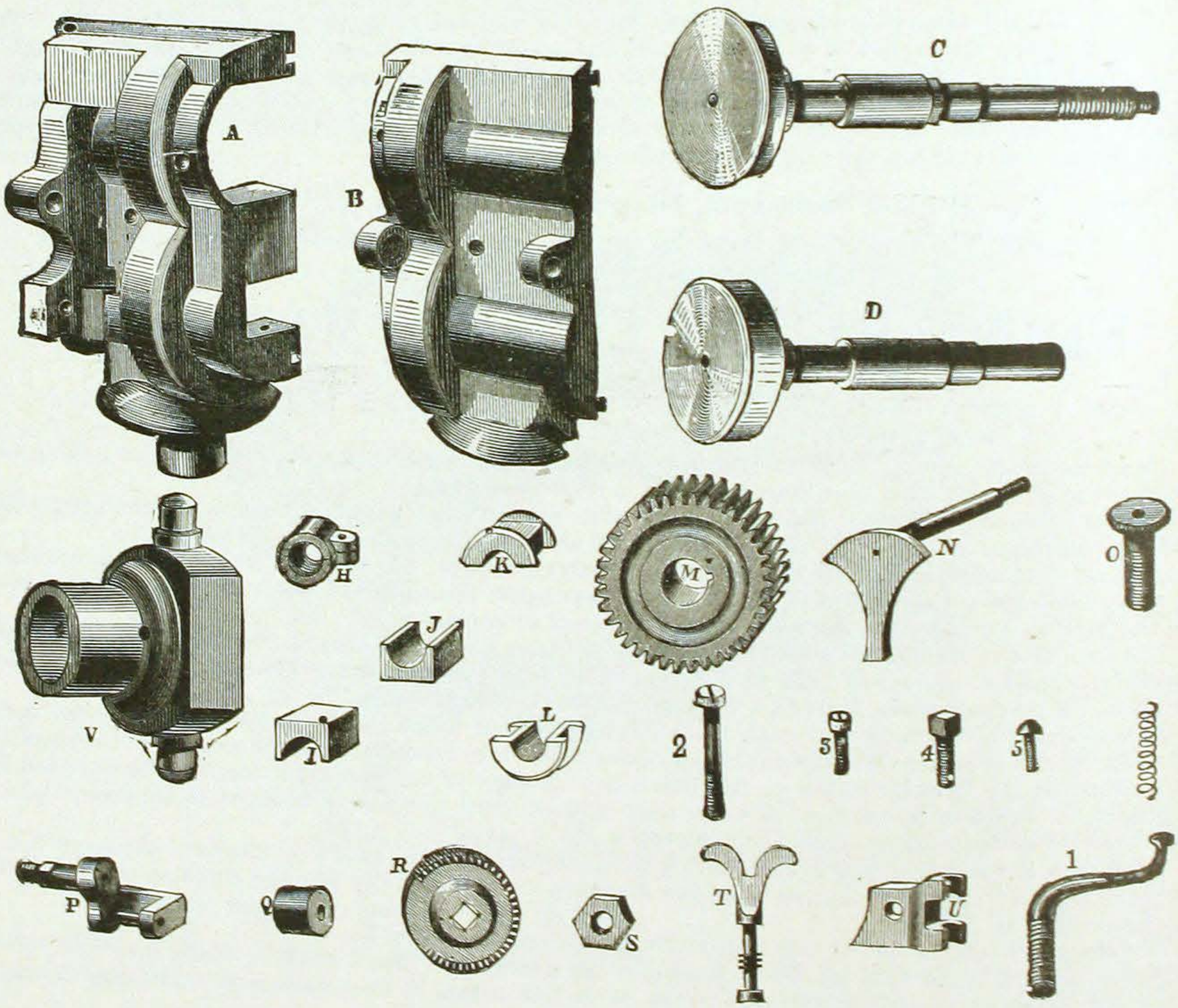
REPRESENTATION

OF THE

INTERCHANGEABLE PARTS

BELONGING TO

STOW'S ENCASED WIRING MACHINE,



LIST OF

INTERCHANGEABLE PARTS.

BELONGING TO

STOW'S ENCASED WIRING MACHINE.

A.	Frame	$2.50
B.	Cap	1.50
C.	Upper Roller	2.50
D.	Lower Roller	2.50
H.	Clasp Nut	.75
V.	Rocking Box	1.50

Journal Boxes.

I.	Front Upper Box, for Upper Roller	$0.25
J.	Front Lower Box, for Upper Roller	.25
K.	Front and Back, Top Boxes for Lower Roller	.25
L.	Front and Back, Lower Boxes for Lower Roller	.25
M.	Gear	.75
N.	Sliding Gauge	1.25
O.	Sliding Gauge Nut	.75
P.	Forming Gauge, for Wiring Machine	.75
Q.	Forming Gauge Roller, for Wiring Machine	.25
R.	Forming Gauge Worm Gear, for Wiring Machine	1.00
S.	Forming Gauge Nut, for Wiring Machine	.25
T.	Worm Gear Screw	.75
U.	Worm Gear Screw Holder	.25

Screws.

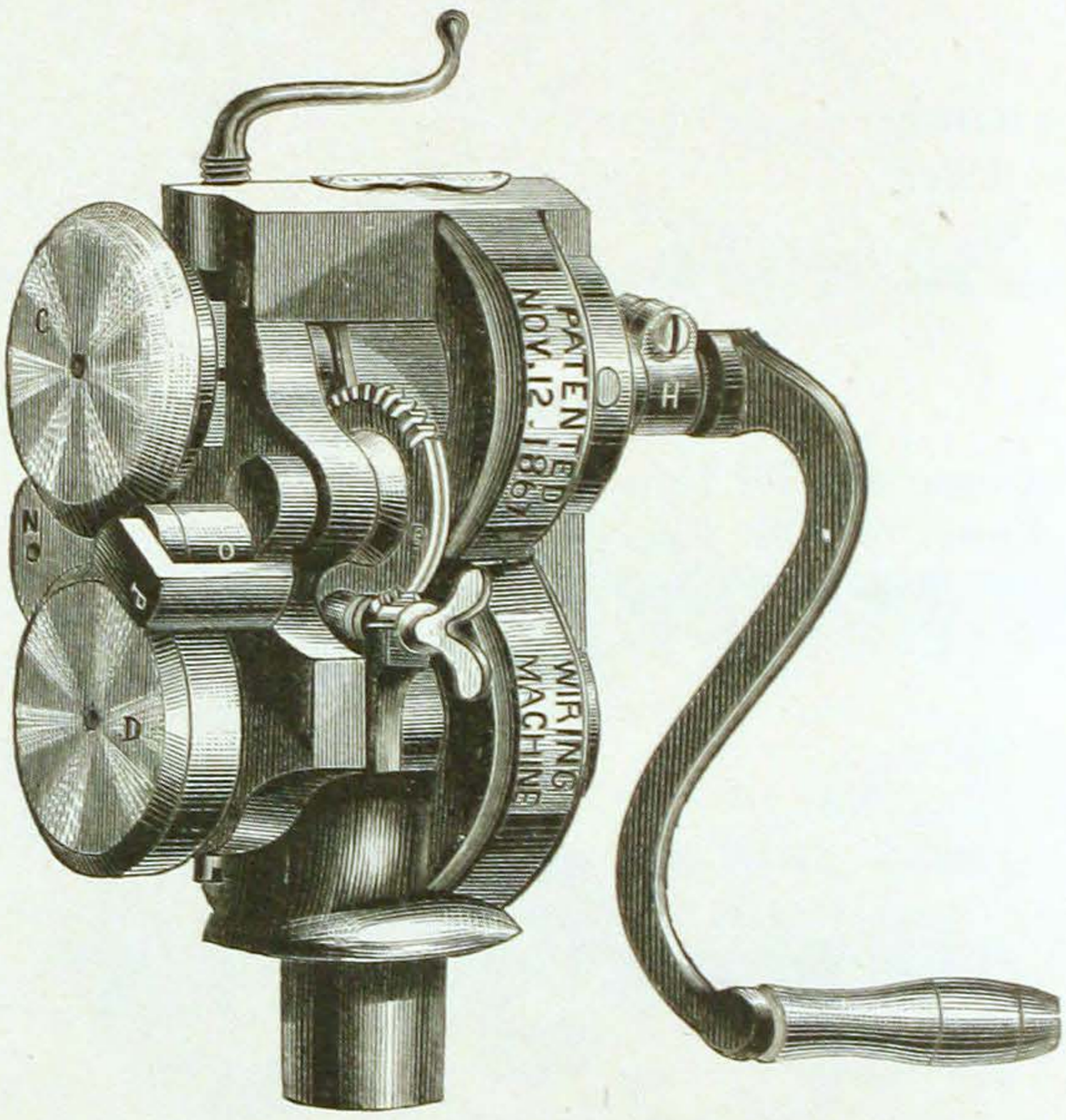
No. 1.	Crank Screw	$0.50
" 2.	Cap Screw	.25
" 3.	Lower Box Screw	.25
" 4.	Worm Gear Screw Holder Bolt	.25
" 5.	Clasp Nut Screw	.15
———	Spring	.10
Extra Faces for Turning and Burring Machines,		each 1.00
Lower Rollers for Burring Machines		" 2.00

The corresponding parts of other Machines in the set bear the same letters or figures as far down as the letter O; also Rocking Box V. Those bearing the letters from P to U inclusive, are found only in the Wiring Machine.

The above prices apply to parts of all Machines.

STOW'S ENCASED MACHINES,

WITH ADJUSTABLE BOXES AND DUPLICATE PARTS.



One-third Size Cut.

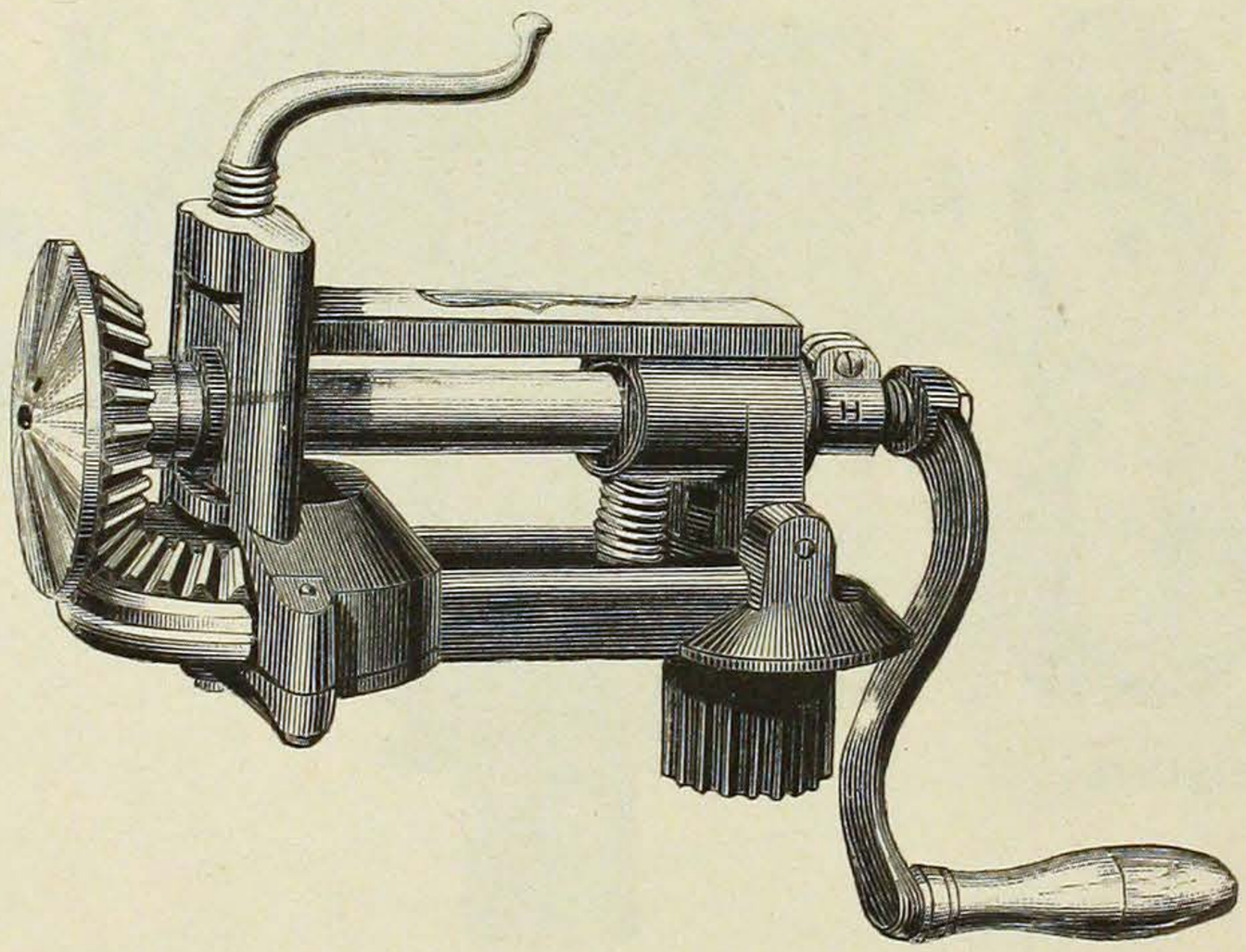
Wiring Machine.

Encased Wiring Machine, with Standard		$14.00
Encased Wiring Machine, without Standard		13.25
Extra Upper or Lower Roller	each	2.50

Extra Faces for Encased Wiring Machines are only furnished with the Arbor or Shaft. See letters C and D, page 10.

STOW'S ENCASED MACHINES,

WITH ADJUSTABLE BOXES AND DUPLICATE PARTS.



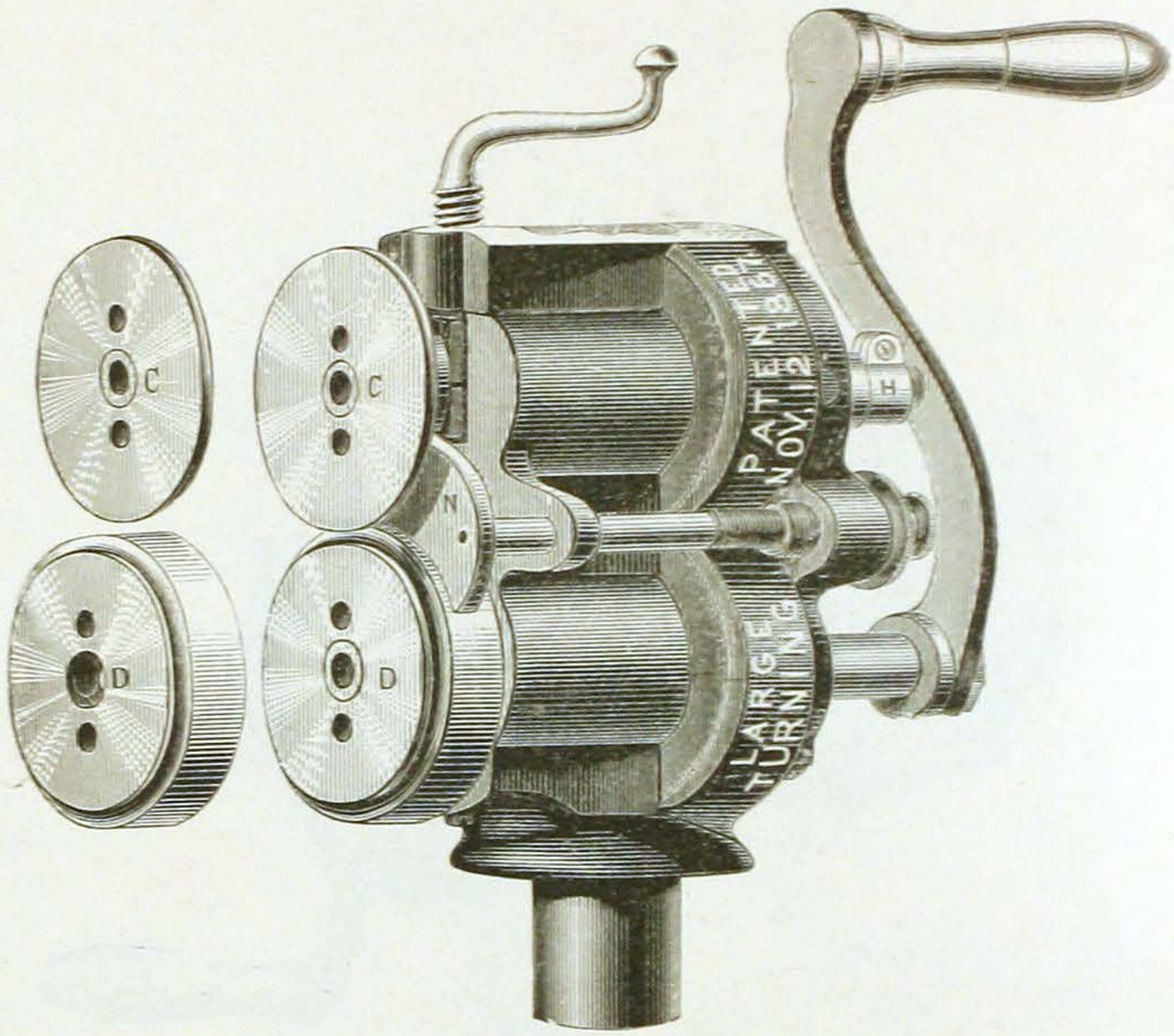
One-third Size Cut.

Setting Down Machine.

Encased Setting Down Machine, with Standard	**$9.75**
Encased Setting Down Machine, without Standard	**9.00**
Extra Heavy Setting Down Machine, for seams $\frac{3}{16}$ inch wide, with Standard .	**12.00**
Extra Upper or Lower Rolls for Setting Down Machine . . . each	**3.00**
Lower Journal Plate for Encased Setting Down Machine	**.50**

STOW'S ENCASED MACHINES,

WITH ADJUSTABLE BOXES AND DUPLICATE PARTS.



One-third Size Cut.

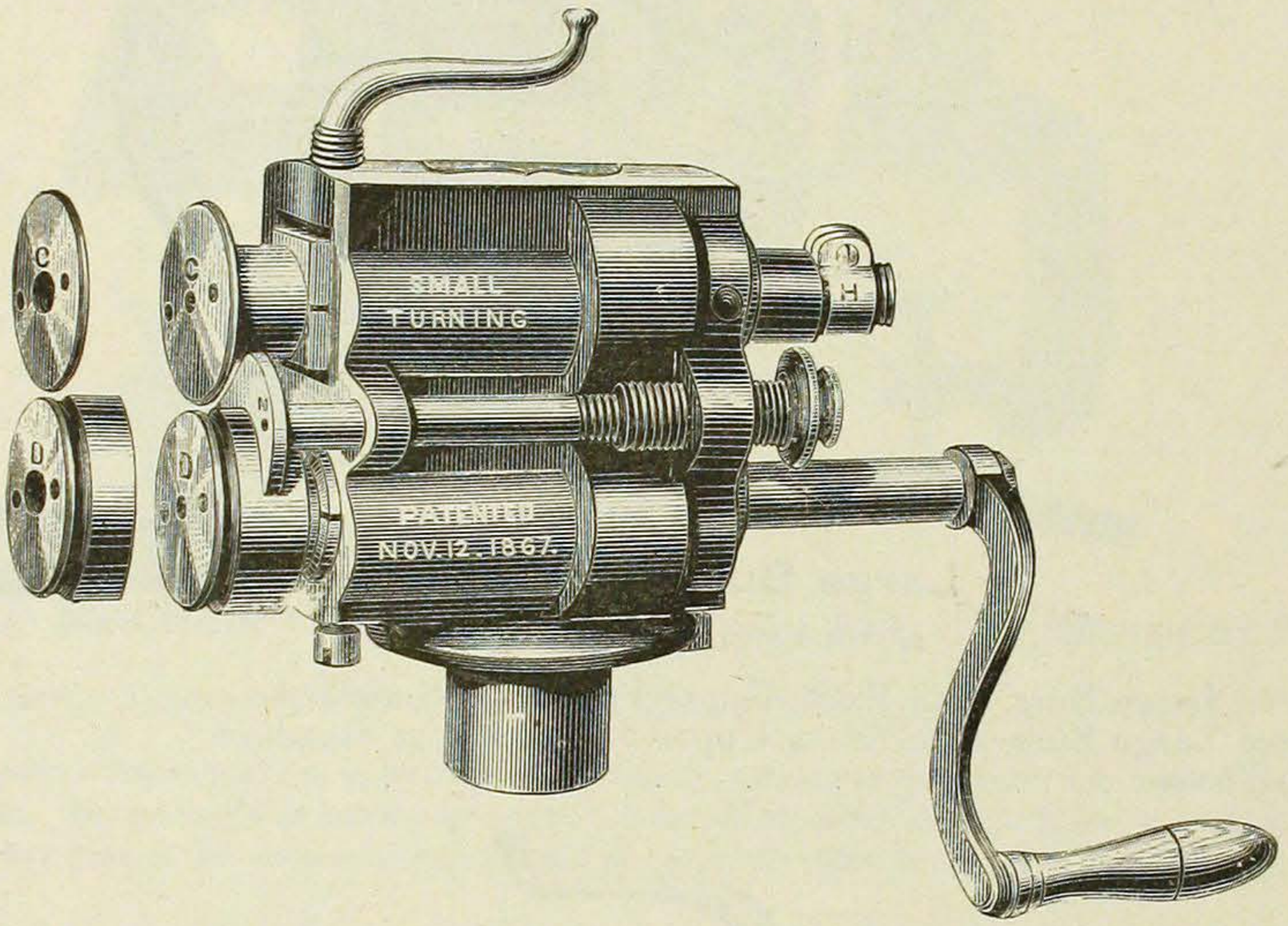
Large Turning Machine.

WITH EXTRA FACES.

Encased Large Turning, with Extra Upper and Lower Face, with Standard		$11.50
Encased Large Turning, with Extra Upper and Lower Face, without Standard,		10.75
Extra Faces	each	1.00

STOW'S ENCASED MACHINES,

WITH ADJUSTABLE BOXES AND DUPLICATE PARTS.



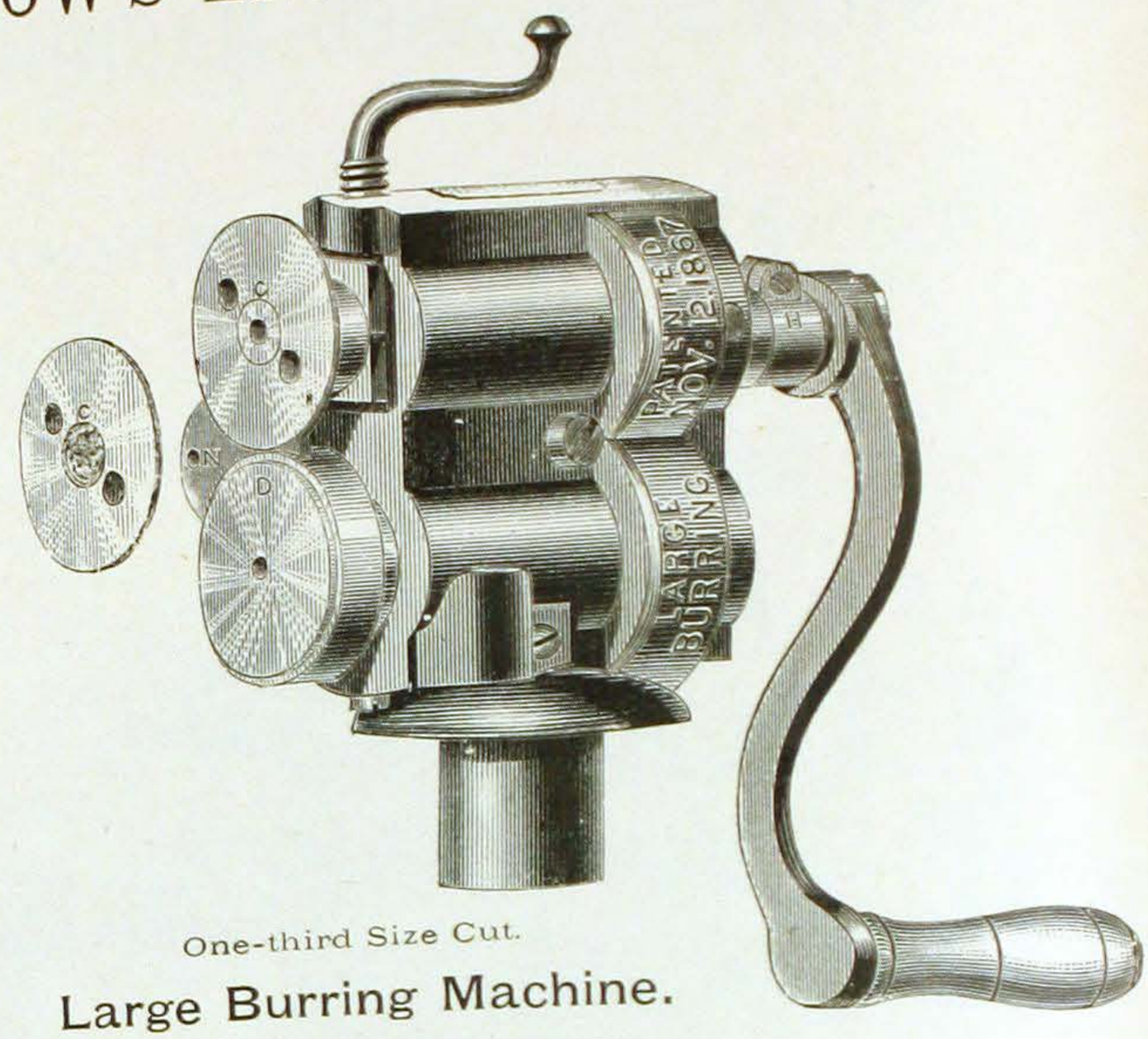
One-third Size Cut.

Small Turning Machine.

WITH EXTRA FACES.

Encased Small Turning, with Extra Upper and Lower Face, with Standard	.	$11.25
Encased Small Turning, with Extra Upper and Lower Face, without Standard,		10.50
Encased Extra Small Turning Machine, same size Faces as Small Burr, with Standard	.	12.00
Extra Faces	each	1.00

STOW'S ENCASED MACHINES.

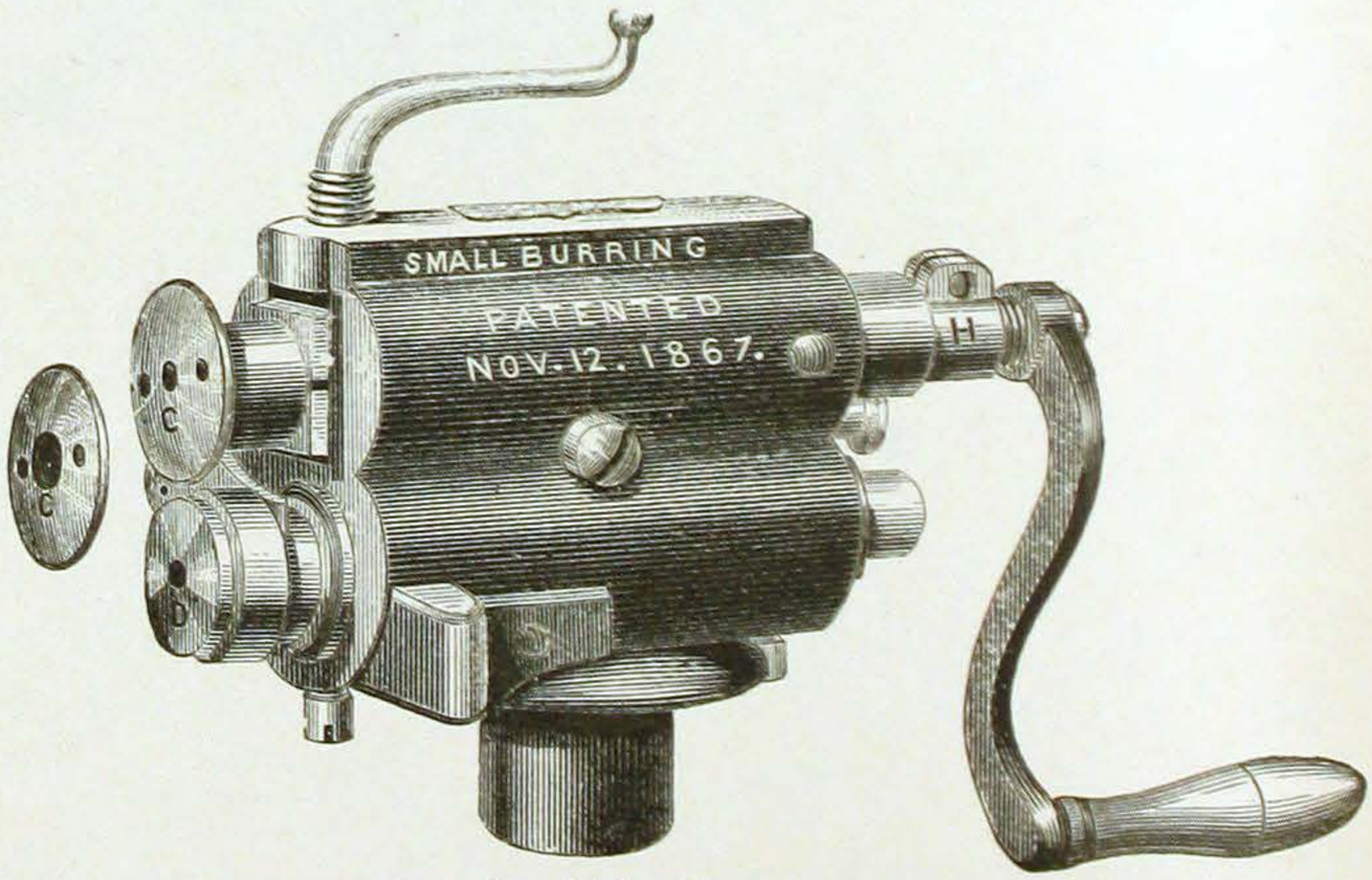


One-third Size Cut.

Large Burring Machine.

WITH EXTRA UPPER FACE.

Encased Large Burr, with Extra Upper Face, with Standard		$10.50
Encased Large Burr, with Extra Upper Face, without Standard		9.75
Extra Faces	each	1.00



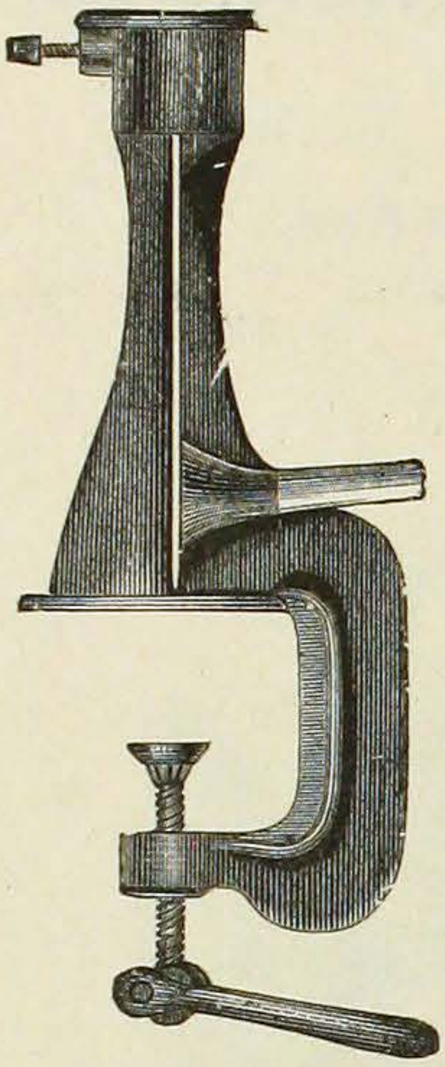
One-third Size Cut.

Small Burring Machine.

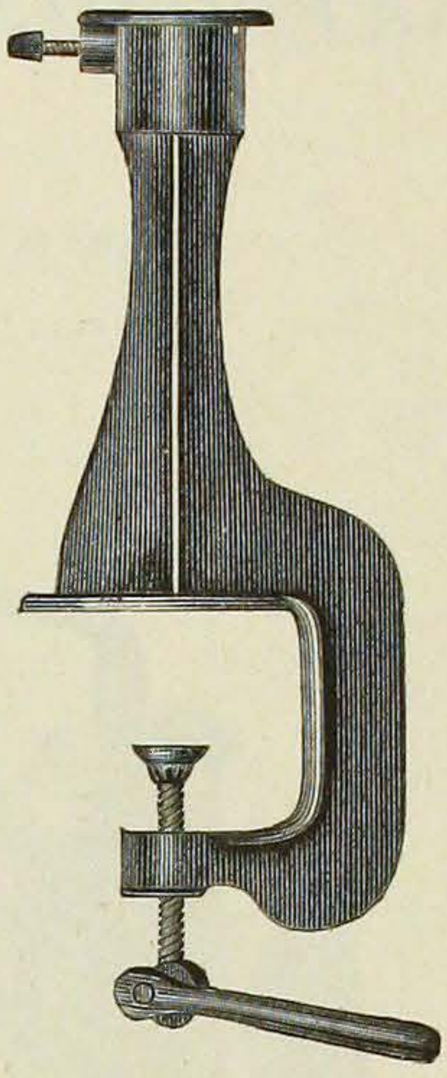
WITH EXTRA UPPER FACE.

Encased Small Burr, with Extra Upper Face, with Standard		$10.00
Encased Small Burr, with Extra Upper Face, without Standard		9.25
Extra Faces	each	1.00

STOW'S IMPROVED MACHINE STANDARDS.



Wiring Machine Standard.



Small Machine Standard.

ENCASED MACHINES ARE ALL PACKED WITH THESE STANDARDS.

These Standards are so made as to be used on any bench, varying in thickness from one to three and one-half inches. The necessity of cutting holes in the bench is obviated, and the Tinner is enabled to use a Machine in any part of his shop most convenient to his work. The WRENCH IS ALWAYS attached to the Standard.

These Standards are also adapted to RAYMOND'S and No. 1 Machines.

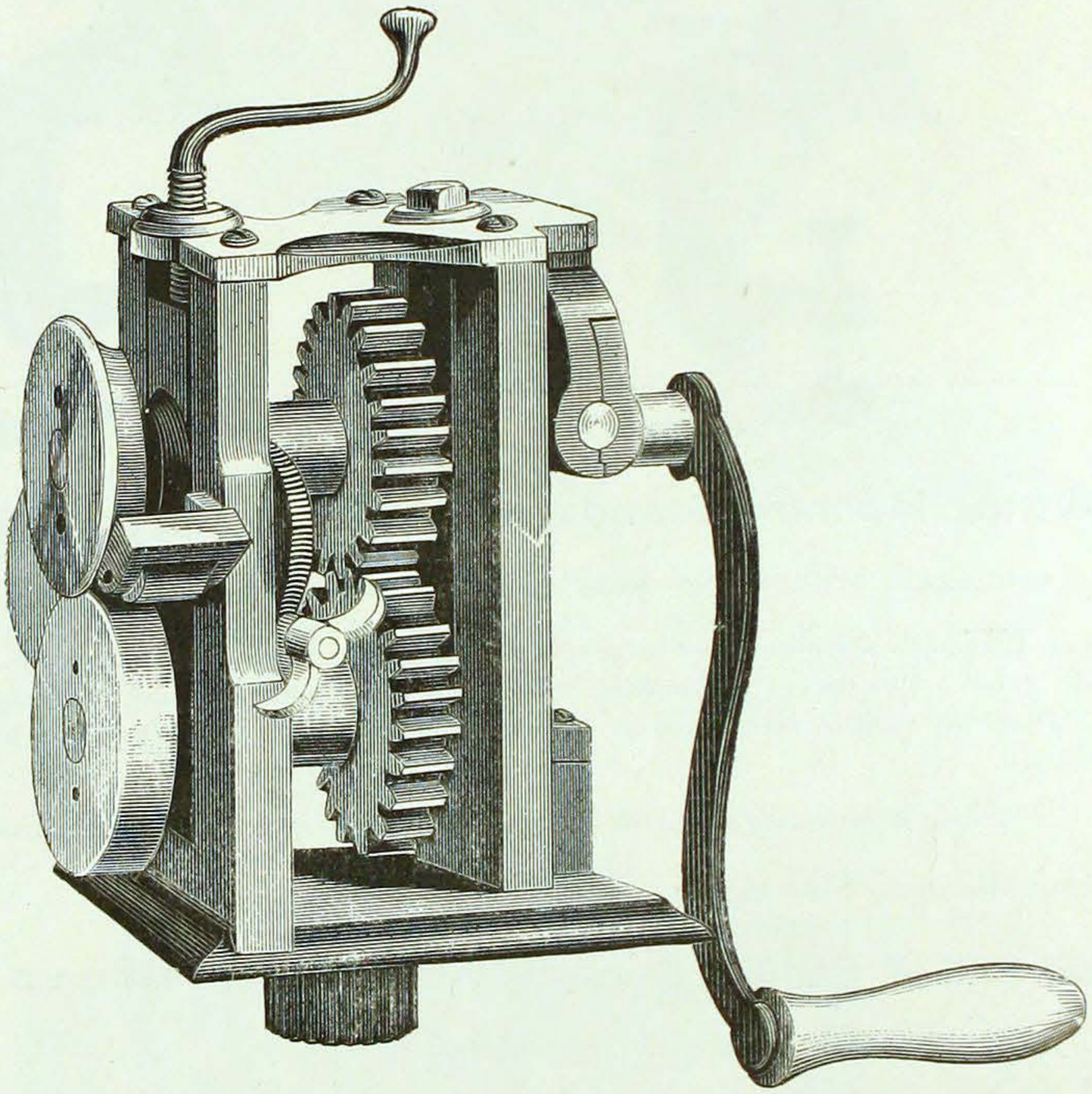
Improved Machine Standards . . . . . each $1.00

A Full Set of Stow's Encased Machines is made up as follows:

Stow's Adjustable Bar Folder, No. 52, 20 inches	$30.00
Stow's Encased Grooving Machine, No. 1, 20 inches, with Standard	13.50
Stow's Encased Wiring Machine, with Standard	14.00
Stow's Encased Setting Down Machine, with Standard	9.75
Stow's Encased Large Turning Machine, with Standard	11.50
Stow's Encased Small Turning Machine, with Standard	11.25
Stow's Encased Large Burring Machine, with Standard	10.50
Stow's Encased Small Burring Machine, with Standard	10.00
Full Set of Encased Machines, with Standards	$110.50
Full Set of Encased Machines, without Standards	106.00
Full Set of Encased Machines, with No. 50 Folder, 17 inches, and No. 2 Encased Groover, 17 inches, with Standards	103.00
Full Set of Encased Machines, without Folder and Groover	67.00
Extra Faces . . . . . each	1.00

RAYMOND'S PATENT MACHINES,

WITH ADJUSTABLE BOXES.



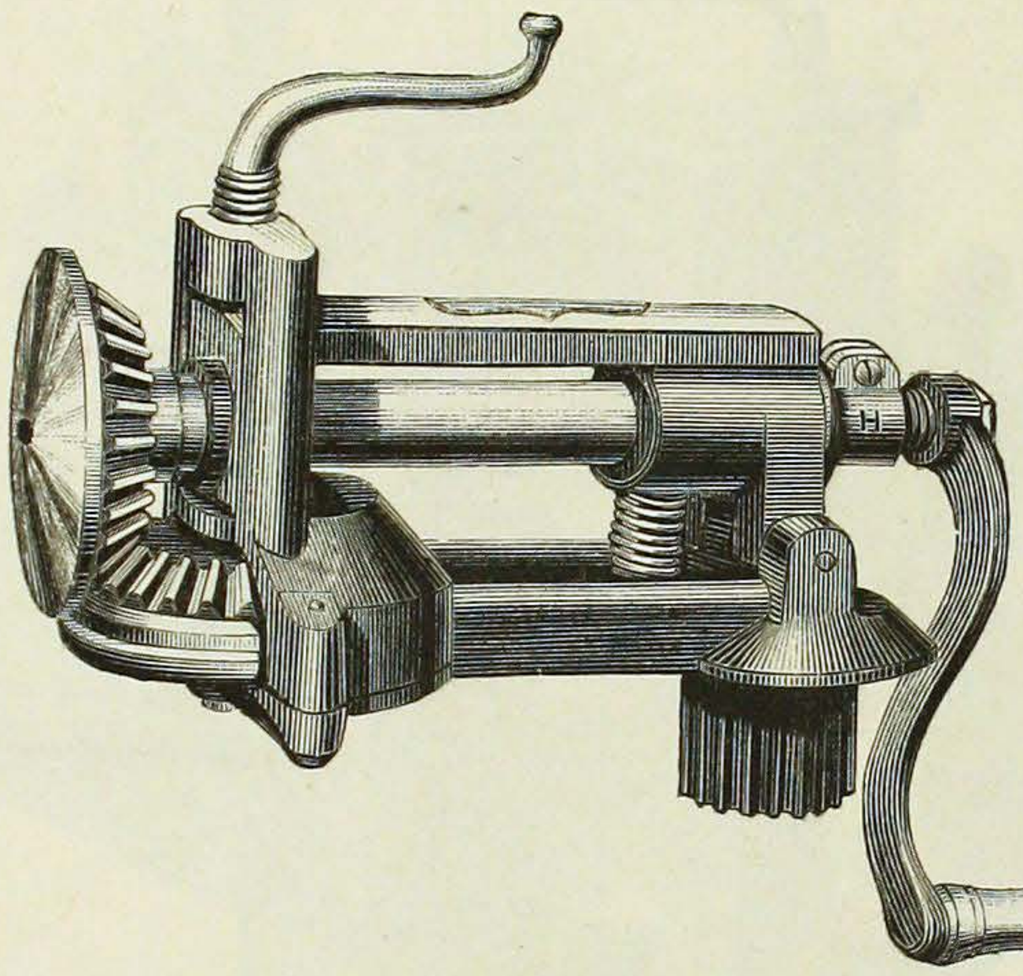
One-third Size Cut.

Wiring Machine.

Raymond's Patent Wiring Machine, with Standard		$12.00
Raymond's Patent Wiring Machine, without Standard		11.25
Extra Faces for Wiring Machine	each	1.25

RAYMOND'S PATENT MACHINES,

WITH ADJUSTABLE BOXES,



One-third Size Cut.

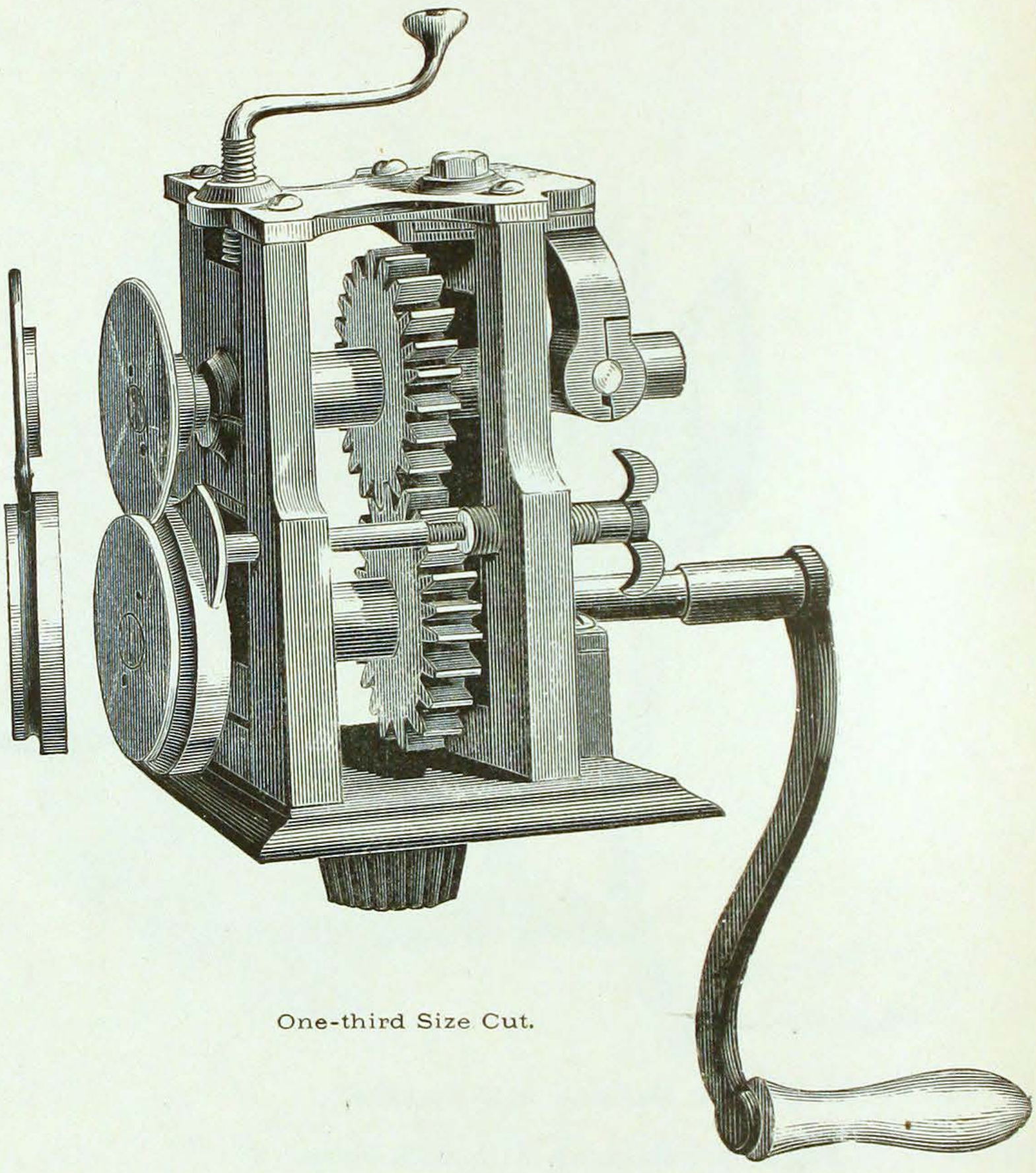
Setting Down Machine.

Raymond's Setting Down Machine, with Standard		$9.75
Raymond's Setting Down Machine, without Standard		9.00
Extra Upper or Lower Rolls for Setting Down Machine . . .	each	3.00
Lower Journal Plate for Raymond's Setting Down Machine		.50

NOTE.—Stow's Improved Standards are adapted to all of Raymond's Machines.

RAYMOND'S PATENT MACHINES,

WITH ADJUSTABLE BOXES,



One-third Size Cut.

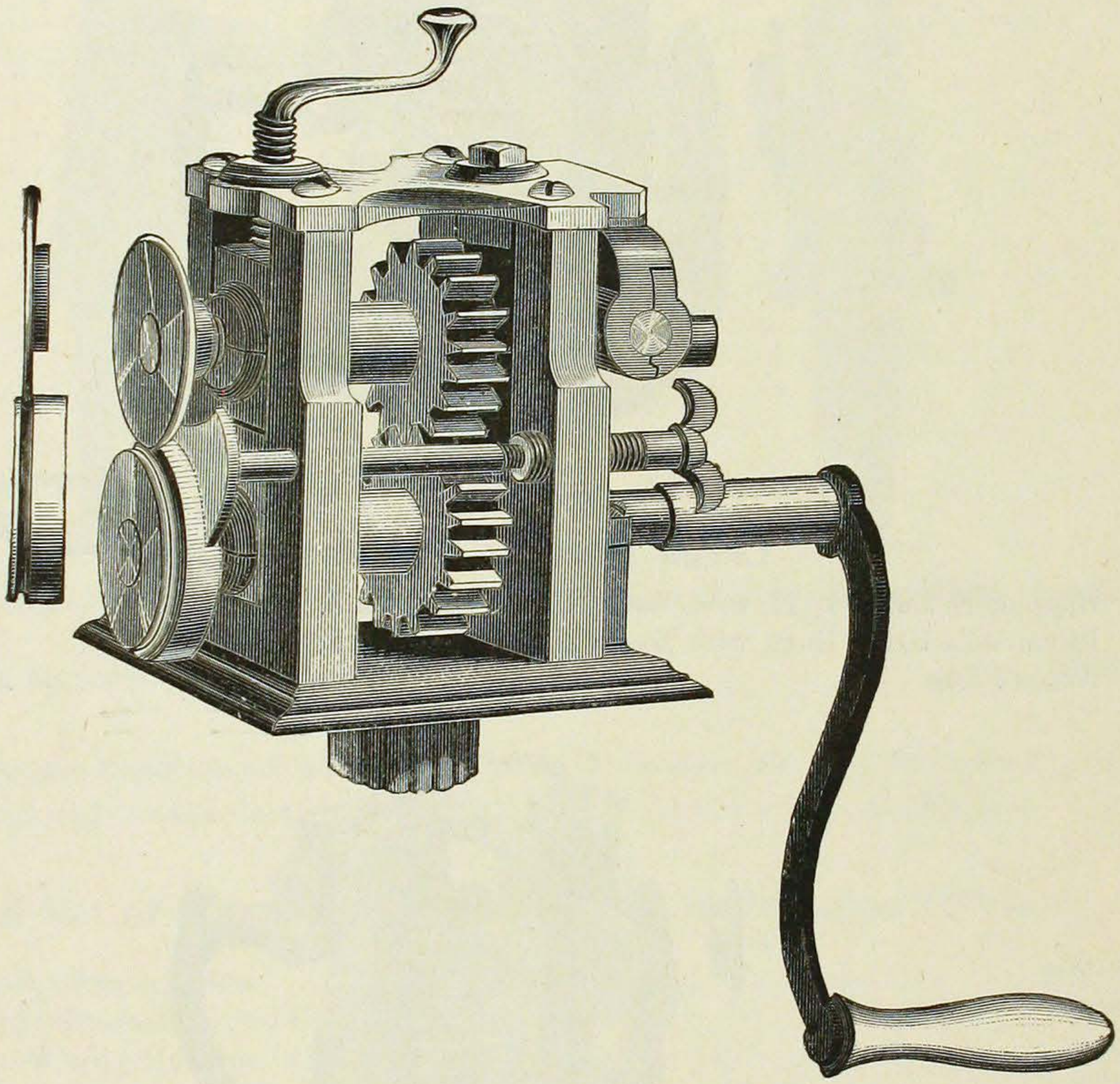
Large Turning Machine.

WITH EXTRA FACES.

Raymond's Large Turning Machine, with Extra Upper and Lower Face, with Standard		$10.25
Raymond's Large Turning Machine, with Extra Upper and Lower Face, without Standard		9.50
Extra Faces	each	1.00

RAYMOND'S PATENT MACHINES,

WITH ADJUSTABLE BOXES.



One-third Size Cut.

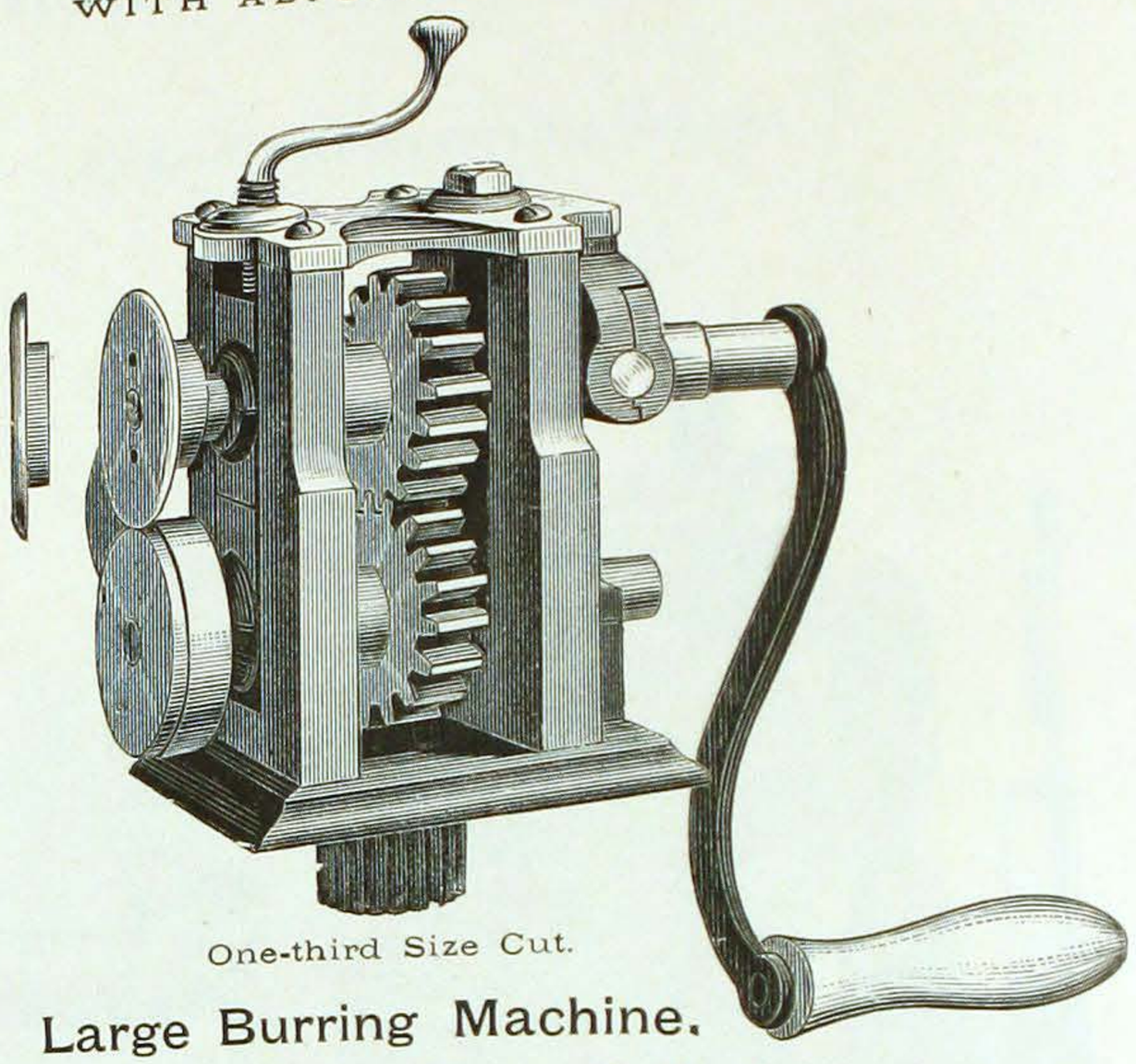
Small Turning Machine.

WITH EXTRA FACES.

Raymond's Small Turning Machine, with Extra Upper and Lower Face, with Standard		$10.00
Raymond's Small Turning Machine, with Extra Upper and Lower Face, without Standard		9.25
Extra Faces	each	1.00

RAYMOND'S PATENT MACHINES,

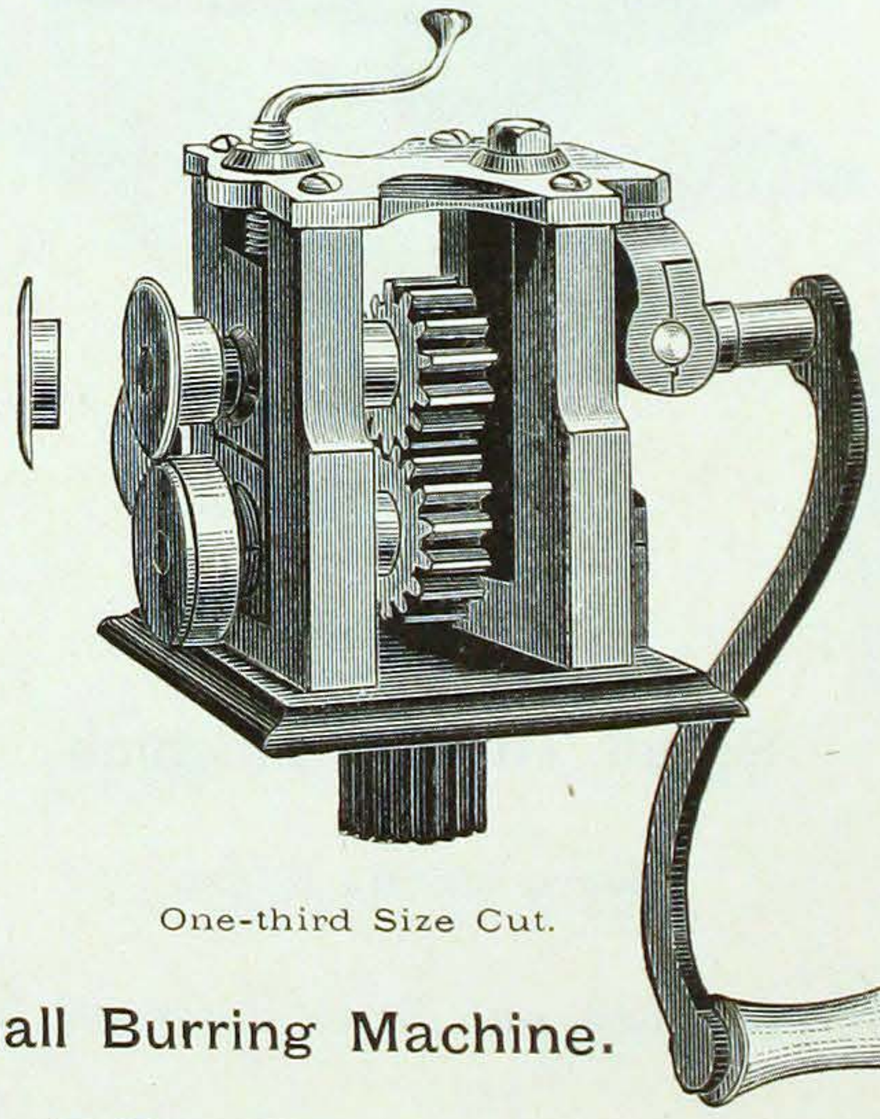
WITH ADJUSTABLE BOXES.



One-third Size Cut.

Large Burring Machine.

Raymond's Large Burr, with Extra Upper Face, with Standard		$9.00
Raymond's Large Burr, with Extra Upper Face, without Standard		8.25
Extra Faces	each	1.00

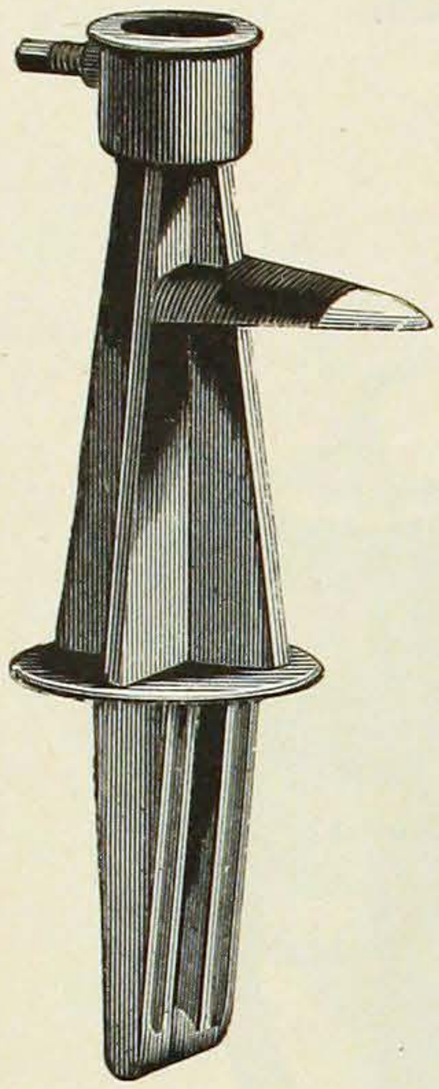


One-third Size Cut.

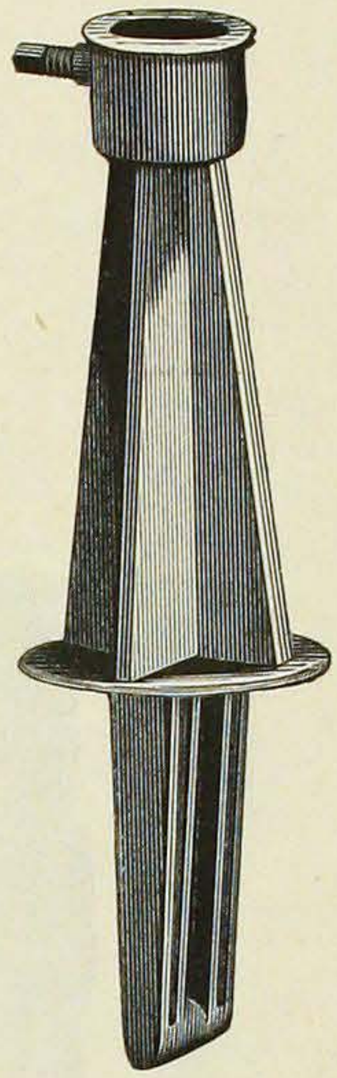
Small Burring Machine.

Raymond's Small Burr, with Extra Upper Face, with Standard		$8.50
Raymond's Small Burr, with Extra Upper Face, without Standard		7.75
Extra Faces	each	1.00

RAYMOND'S MACHINE STANDARDS.



Wiring Machine Standard.



Small Machine Standard.

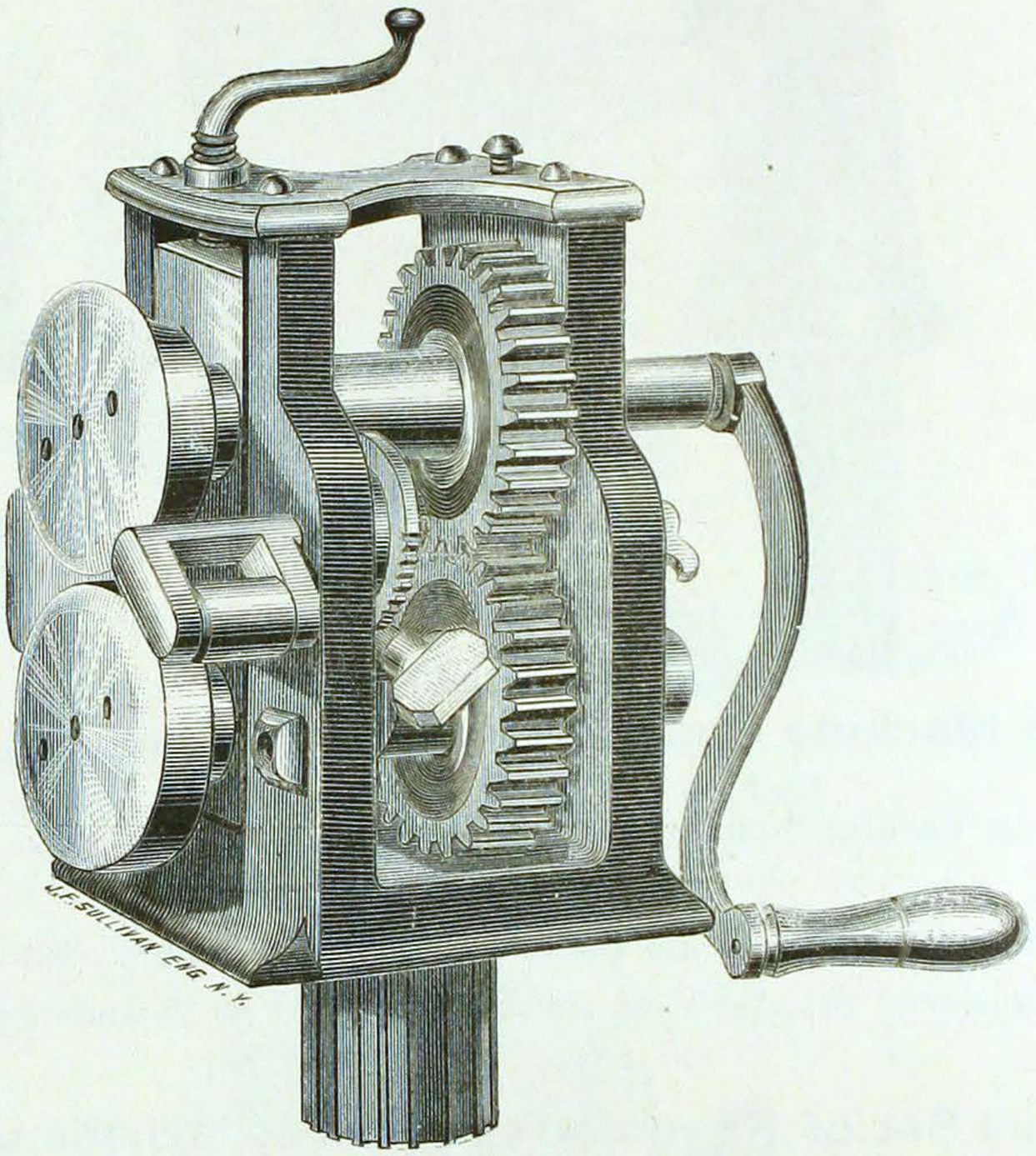
Raymond's Machine Standards . . . . . each $0.75

Raymond's Machines are packed with these Standards, but may be ordered with Stow's Improved Standards at an additional cost of 25 cents for each Machine.

A Full Set of Raymond's Machines is made up as follows:

Stow's No. 0, 20 inch Folder	$30.00
No. 1, 20 inch Brass-Mounted Groover	13.50
Raymond's Wiring Machine, with Standard	12.00
Raymond's Setting Down Machine, with Standard	9.75
Raymond's Large Turning Machine, with Standard	10.25
Raymond's Small Turning Machine, with Standard	10.00
Raymond's Large Burring Machine, with Standard	9.00
Raymond's Small Burring Machine, with Standard	8.50
Full Set of Machines, as above, with Standards	$103.00
Full Set of Machines, as above, with Stow's Improved Standards	104.50
Full Set of Machines, less Folder and Groover	59.50
Full Set of Machines, with No. 00 Folder, 17 inches, and No. 2 Brass-Mounted Groover, 17 inches	95.50
Extra Faces . . . . . each	1.00
Extra Faces for Wiring Machine . . . . . each	1.25

No. 1 MACHINES.

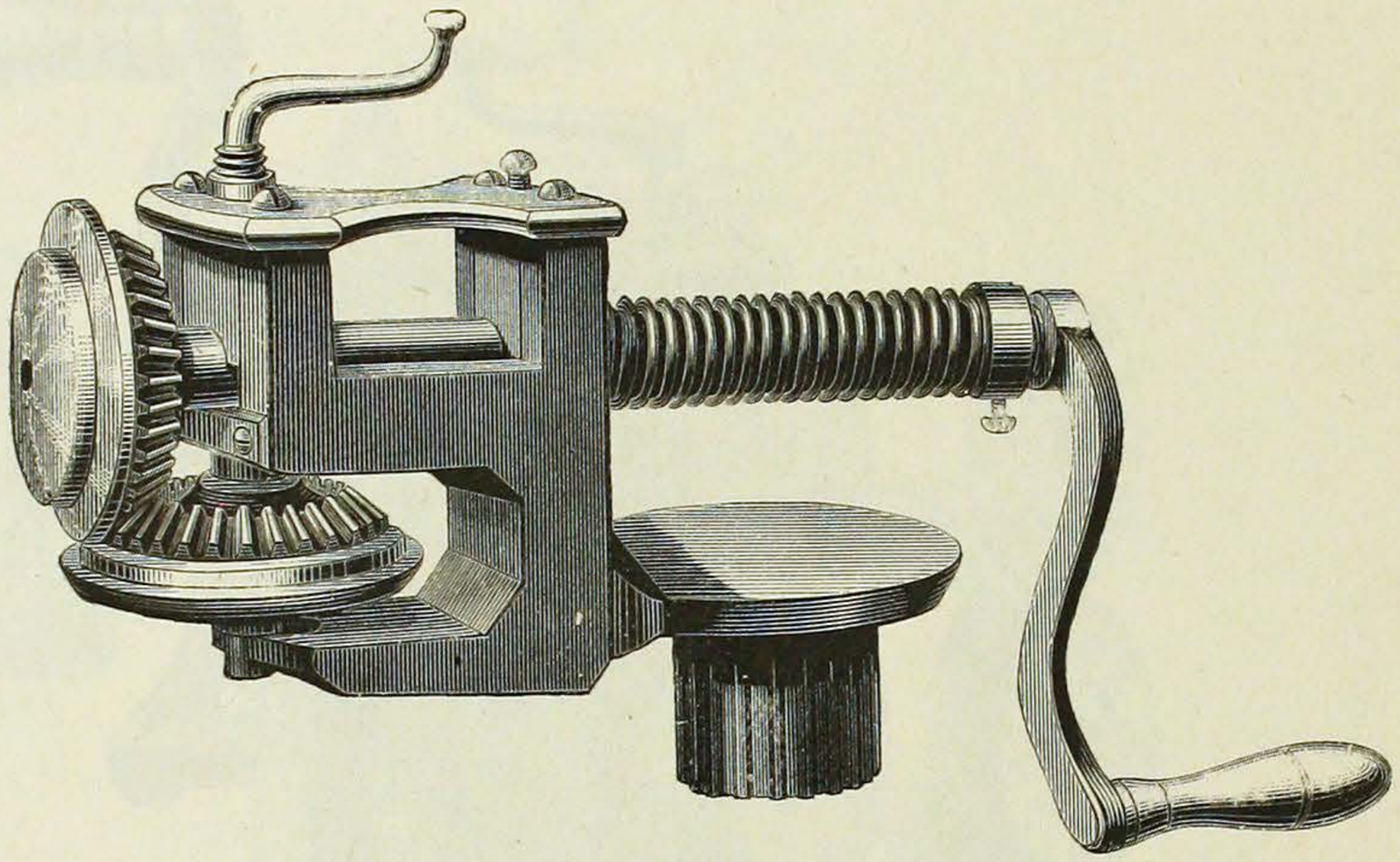


One-third Size Cut.

Wiring Machine.

No. 1 Wiring Machine, with Standard	$12.00
No. 1 Wiring Machine, without Standard	11.25
Extra Faces for No. 1 Wiring Machine . . . . . each	1.25

No. 1 MACHINES.



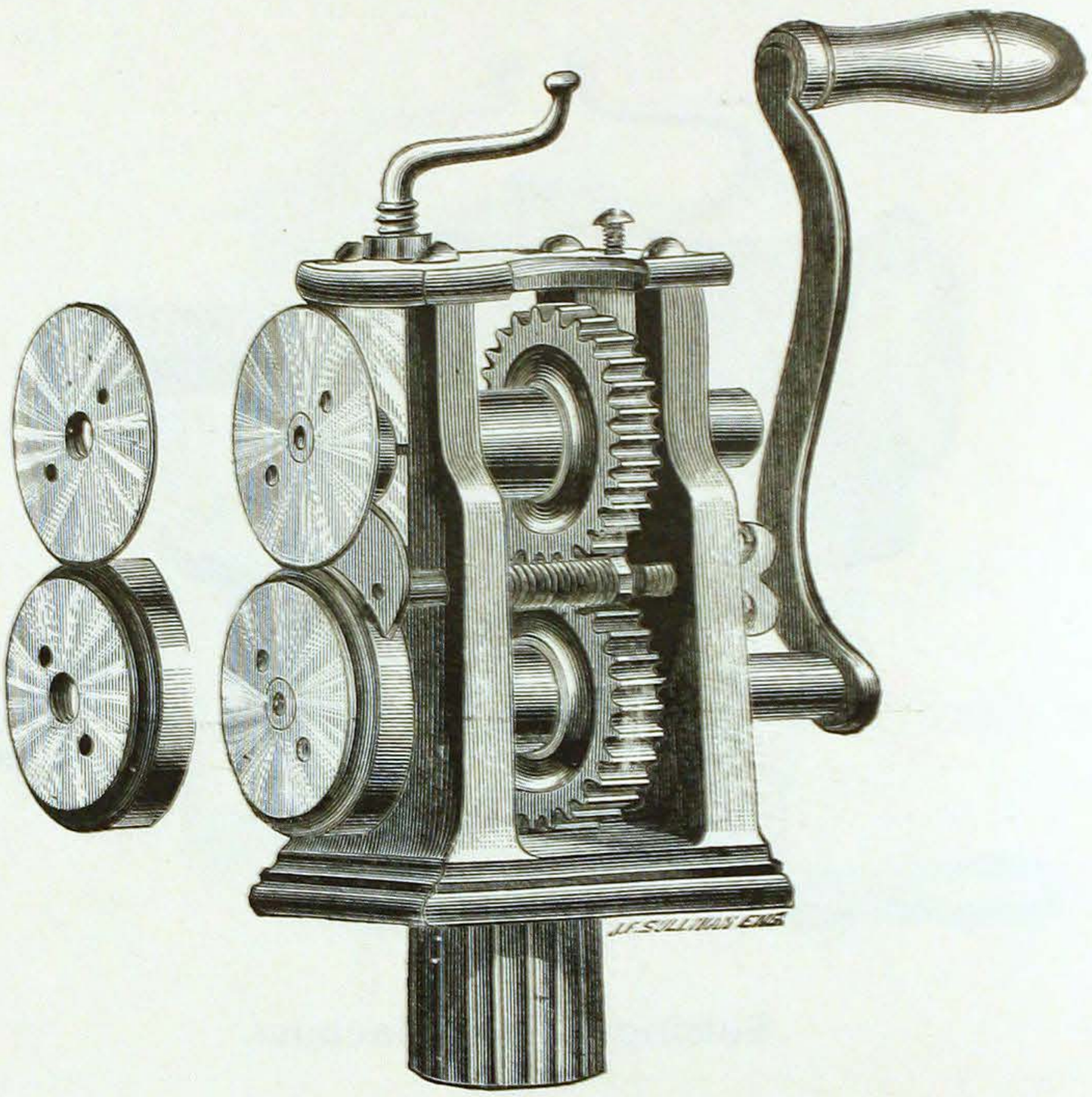
One-third Size Cut.

Setting Down Machine.

No. 1 Setting Down Machine, with Standard	$9.75
No. 1 Setting Down Machine, without Standard	9.00
Upper Wheel for No. 1 Setting Down Machine	3.00
Lower Wheel for No. 1 Setting Down Machine	3.00
Brass Top Plate for No. 1 Setting Down Machine	1.25

NOTE.—Stow's Improved Standards are adapted to all No. 1 Machines.

No. 1 MACHINES.



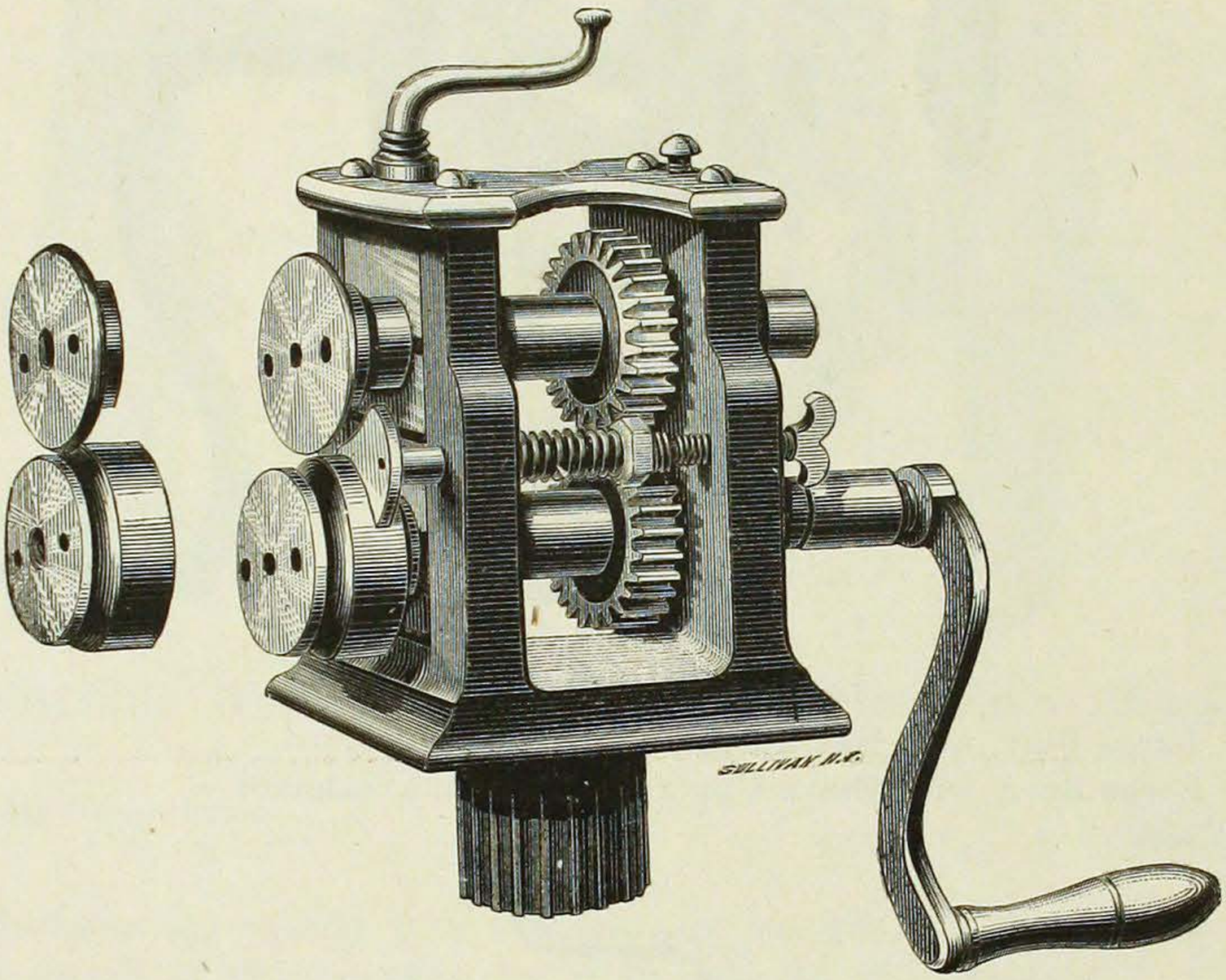
One-third Size Cut.

Large Turning Machine.

WITH EXTRA FACES.

No. 1 Large Turning Machine, with Extra Upper and Lower Face, with Standard	$10.25
No. 1 Large Turning Machine, with Extra Upper and Lower Face, without Standard	9.50
Extra Faces . . . . . each	1.00

No. 1 MACHINES.



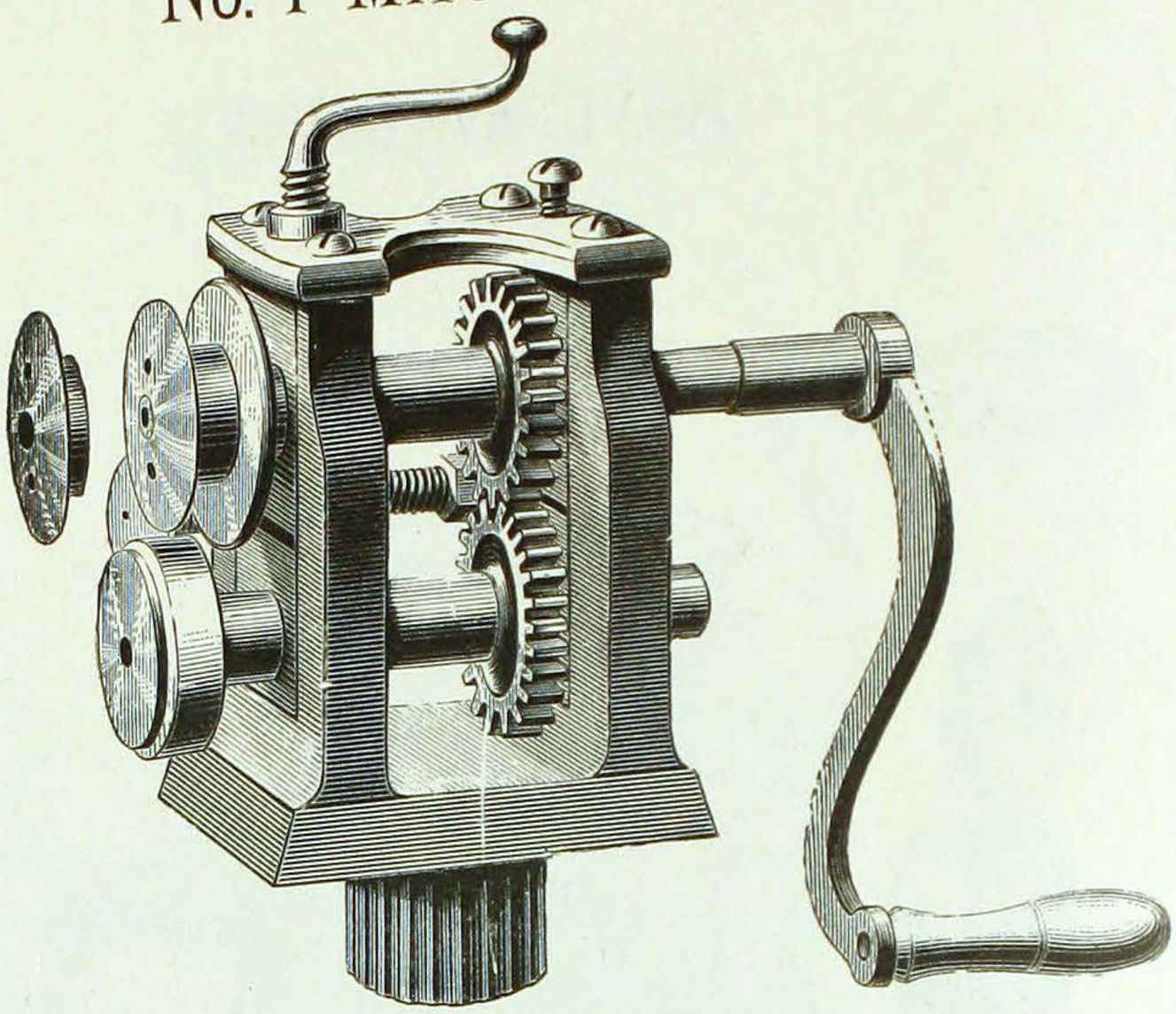
One-third Size Cut.

Small Turning Machine.

WITH EXTRA FACES.

No. 1 Small Turning Machine, with Extra Upper and Lower Face, with Standard	$10.00
No. 1 Small Turning Machine, with Extra Upper and Lower Face, without Standard	9.25
No. 1 Extra Small Turning Machine, same size Faces as Extra Small Burr, with Standard	12.00
Extra Faces . . . . . each	1.00

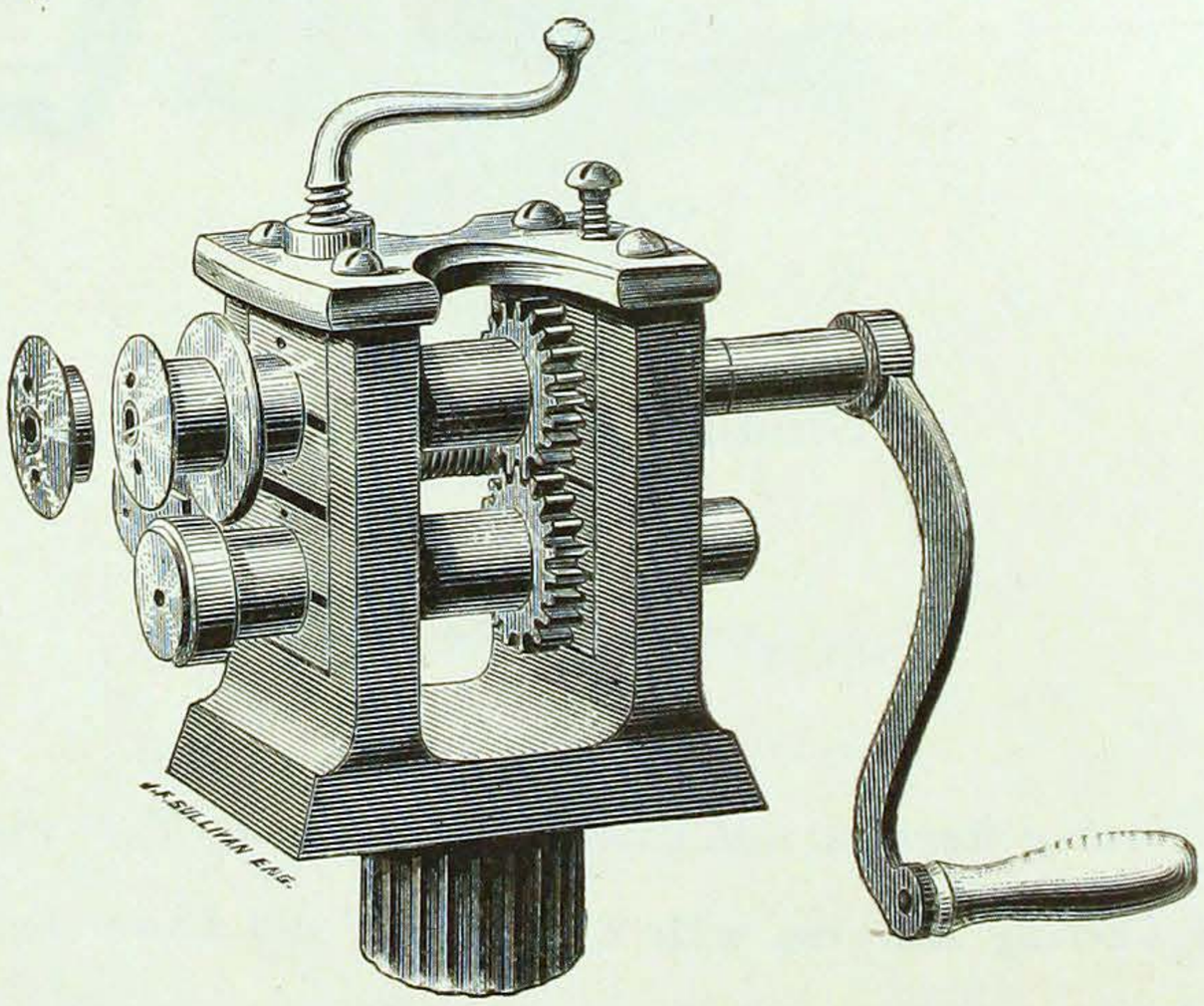
No. 1 MACHINES.



One-third Size Cut.

Large Burring Machine.

No. 1.	Large Burr, with Extra Upper Face, with Standard	$9.00
No. 1.	Large Burr, with Extra Upper Face, without Standard	8.25
Extra Faees	. . . . . each	1.00

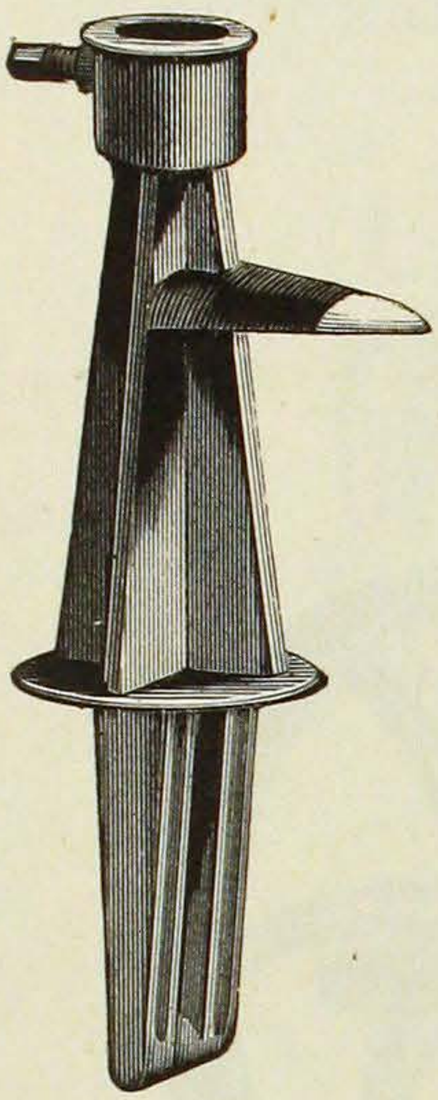


One-third Size Cut.

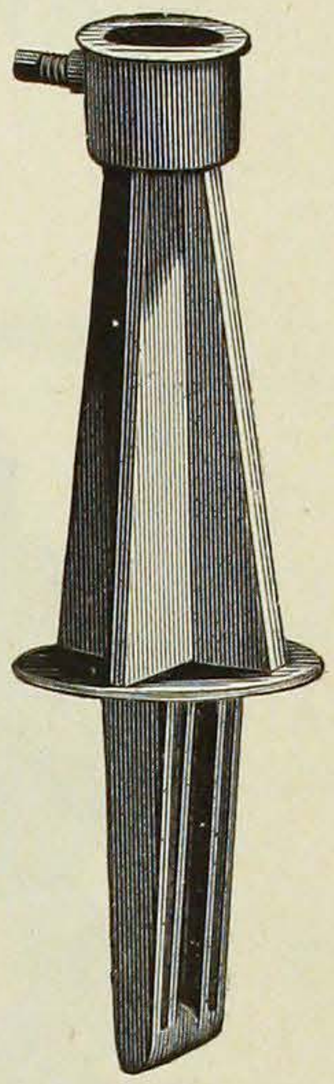
Small Burring Machine.

No. 1.	Small Burr, with Extra Upper Face, with Standard	$8.50
No. 1.	Small Burr, with Extra Upper Face, without Standard	7.75
Extra Faces	. . . . . each	1.00

No. 1 MACHINE STANDARDS.



Wiring Machine Standard.



Small Machine Standard.

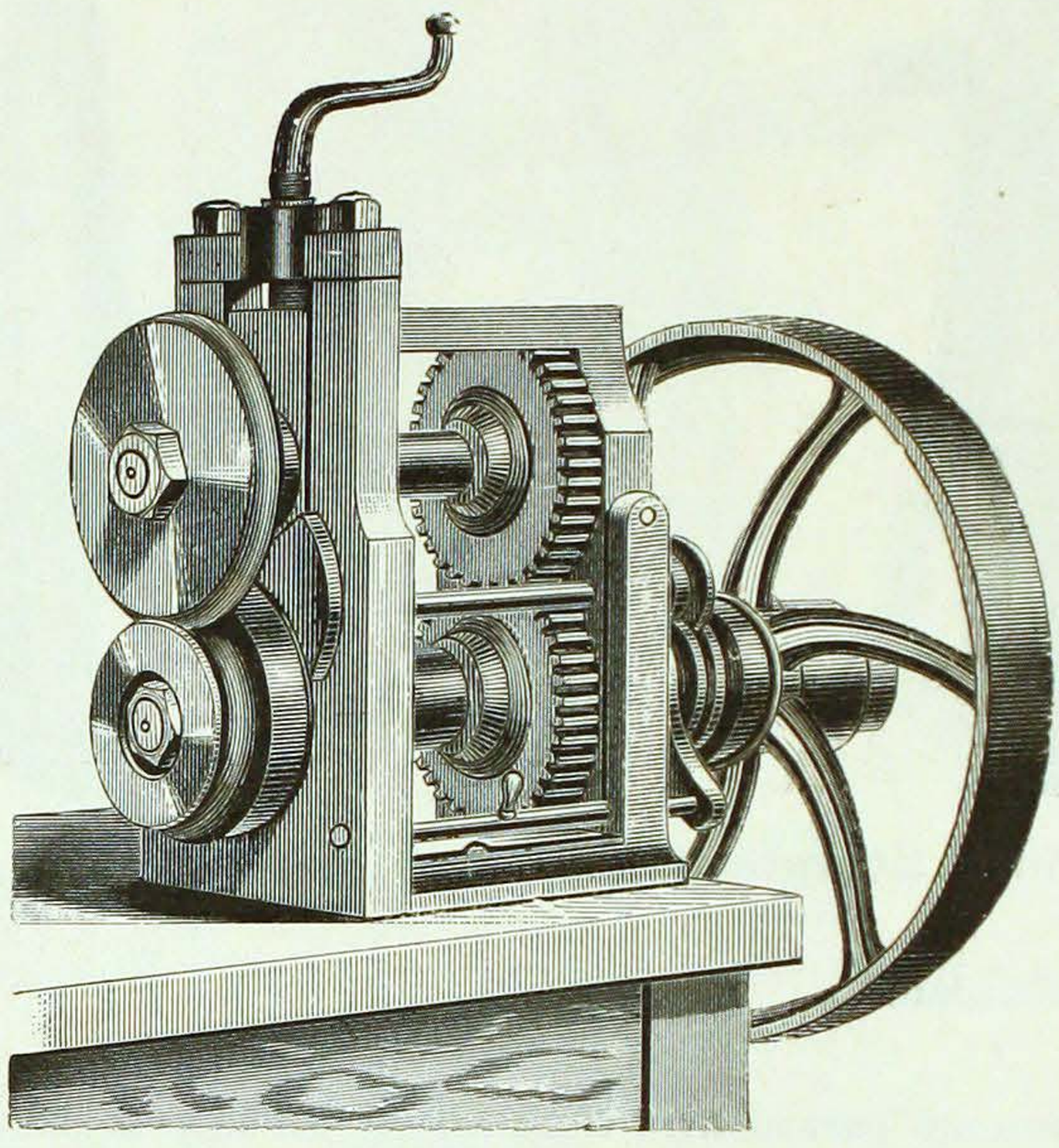
No. 1. Machine Standards . . . . . each $0.75

No. 1 Machines are packed with these Stands, but may be ordered with Stow's Improved Standards at an additional cost of 25 cents for each Machine.

A Full Set of No. 1 Machines is made up as follows:

Stow's No. 0 Folder, 20 inches	$30.00
No. 1. Brass-Mounted Groover, 20 inches	13.50
No. 1. Wiring Machine, with Standard	12.00
No. 1. Setting Down Machine, with Standard	9.75
No. 1. Large Turning Machine, with Standard	10.25
No. 1. Small Turning Machine, with Standard	10.00
No. 1. Large Burring Machine, with Standard	9.00
No. 1. Small Burring Machine, with Standard	8.50
Full Set of No. 1 Machines, with Standards	$103.00
Full Set of No. 1 Machines, as above, with Stow's Improved Standards	104.50
Full Set of No. 1 Machines, less Folder and Groover	59.50
Full Set of No. 1 Machines, with No. 00 Folder, 17 inches, and No. 2 B. M. Groover, 17 inches	95.50
Extra Faces . . . . . each	1.00
Extra Faces for No. 1 Wiring Machines . . . . . each	1.25

POWER MACHINES.



Power Turning Machine.

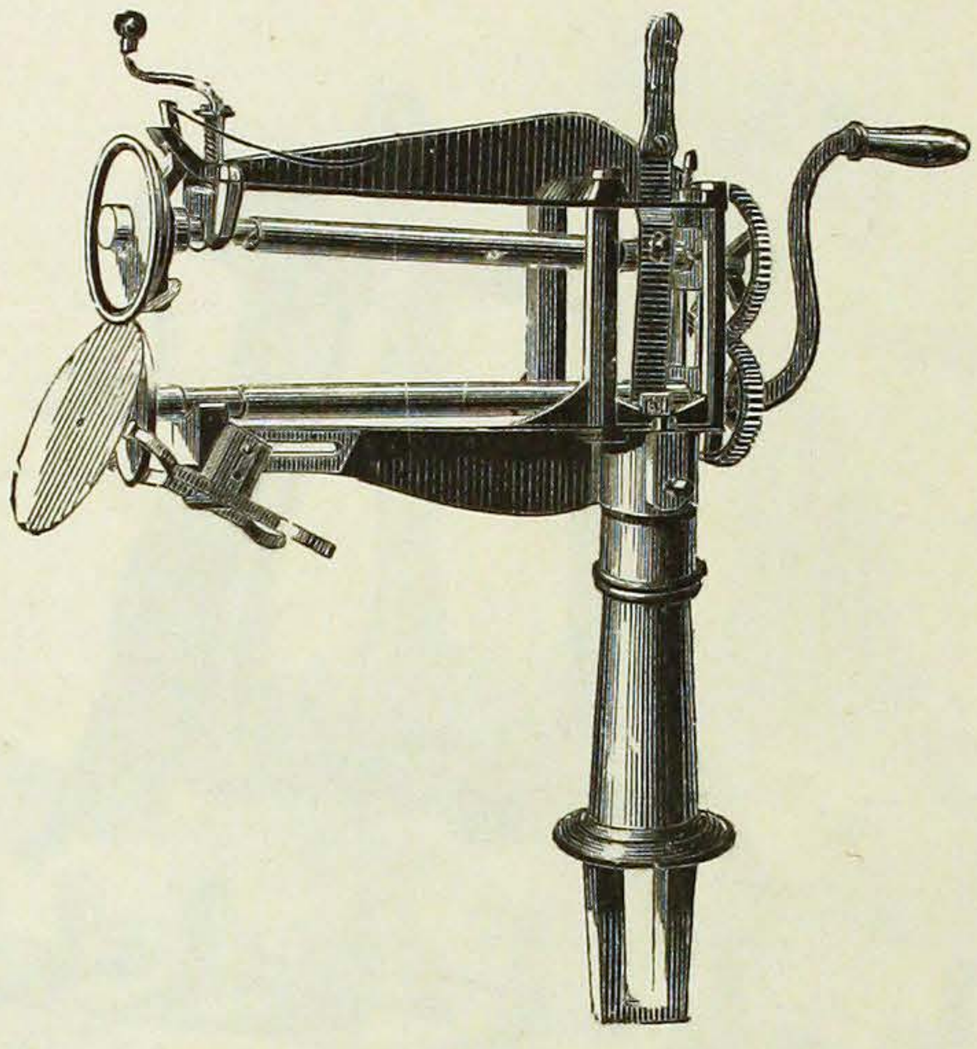
These Machines are intended for use on very heavy work, and are suitable for Brass Kettles and other vessels made of heavy sheet metal. Wire can be used as large as *one inch* in diameter.

The Turning Machine is used in bending or curving the top of the vessel for the wire, which is inserted to give it additional strength and finish. The Wiring Machine is used to finish the operation by completely and compactly covering the wire.

Weight of each Machine complete, 200 lbs.

Wiring Machine, for Power	$125.00
Large Turning Machine, for Power	125.00

DOUBLE SEAMING MACHINES.



Moore's Patent Double Seaming Machine, with Stand.

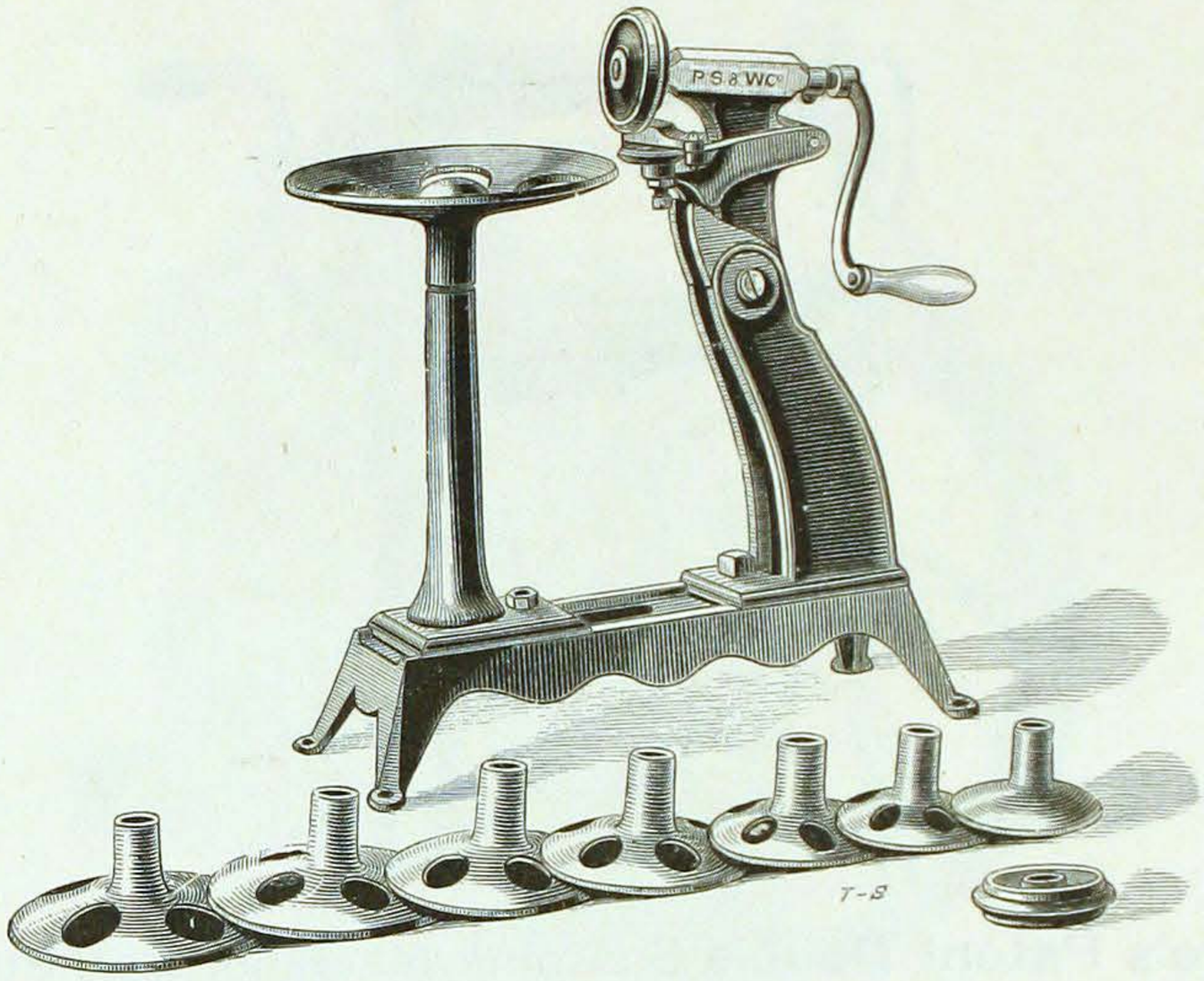
This Machine, simplified by the improvement secured by recent letters-patent, we are enabled to offer at a less price than any other Double Seaming Machine and, *for general use*, we believe will give better satisfaction than the higher priced machines.

We feel warranted in recommending it as a *superior article* and the *best suited* to the wants of ordinary Tinsmiths who desire a Machine adapted to different kinds of work.

No. 3 is especially adapted to Coffee-Pots, and is the only machine that will double seam *all sizes*.

No. 1.	Moore's Patent, for heavy metal, with Stand	$21.00
No. 2.	Moore's Patent, for common work, with Stand	19.00
No. 3.	Moore's Patent, for Coffee-Pots and small work, with Stand .	16.00
	Extra Faces, for Moore's Double Seamer . . . . . each	2.50
	Extra Top Plate, for Moore's Double Seamer, No. 2	1.50
	Frame for Moore's Double Seamer, No. 2	2.50
	Frame for Moore's Double Seamer, No. 3	2.00
	Extra Stands, for either Nos. 1, 2, or 3 . . . . . each	1.00
	Thin Steel Wheel for Moore's Double Seamer . . . . . each	.75

DOUBLE SEAMING MACHINES.



Stow's Patent Double Seaming Machine, with Setting Down Attachment.

ELEVEN DISCS.

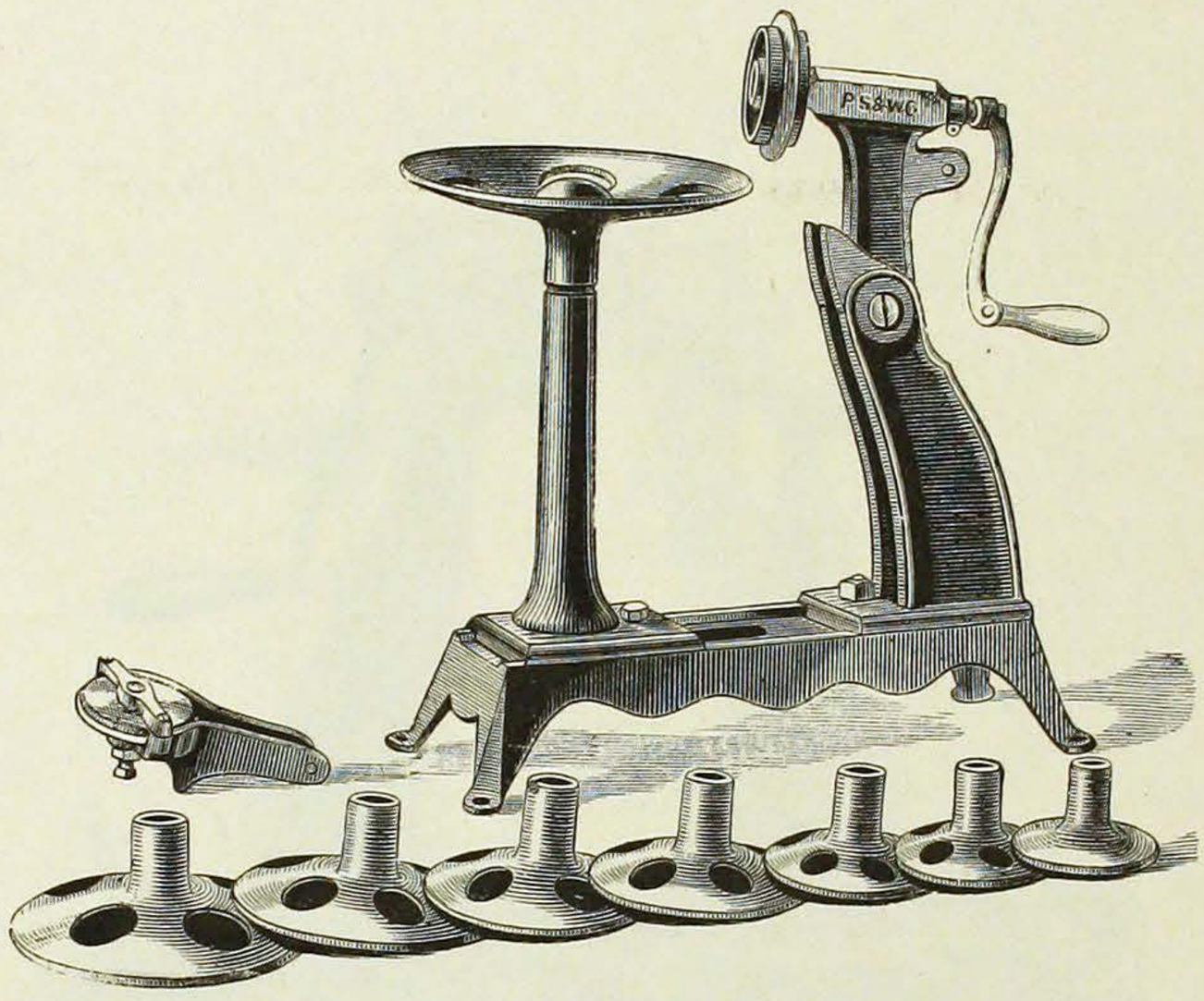
The Setting Down attached to the Machine will set down any work that can be Double Seamed on the Machine. It works rapidly and accurately, and an inexperienced workman can use it without difficulty.

It is also intended to be used on work that does not require to be Double Seamed, and to a large extent will take the place of the Setting Down found in the Set of Machines.

Discs of extra size or shape can be furnished to order to fit the Machine.

No. 5. Stow's Patent Double Seaming Machine, with Setting Down .		$28.00
Extra Discs	. each	1.25
Extra Heads	. each	2.50

DOUBLE SEAMING MACHINES.



Stow's Patent Double Seaming Machine, without Setting Down Attachment.

ELEVEN DISCS.

This Machine is more readily adjusted to double seam vessels of different sizes than any other manufactured. It is also the most expeditious in its operation.

It acts more favorably in passing seams or locks, because the pressure to set down a double seam is obtained by means of a foot lever, which yields as the rolls pass the seam.

It is well adapted to Wash-Basins, Pans, etc., and will do any work that can be done on similar machines.

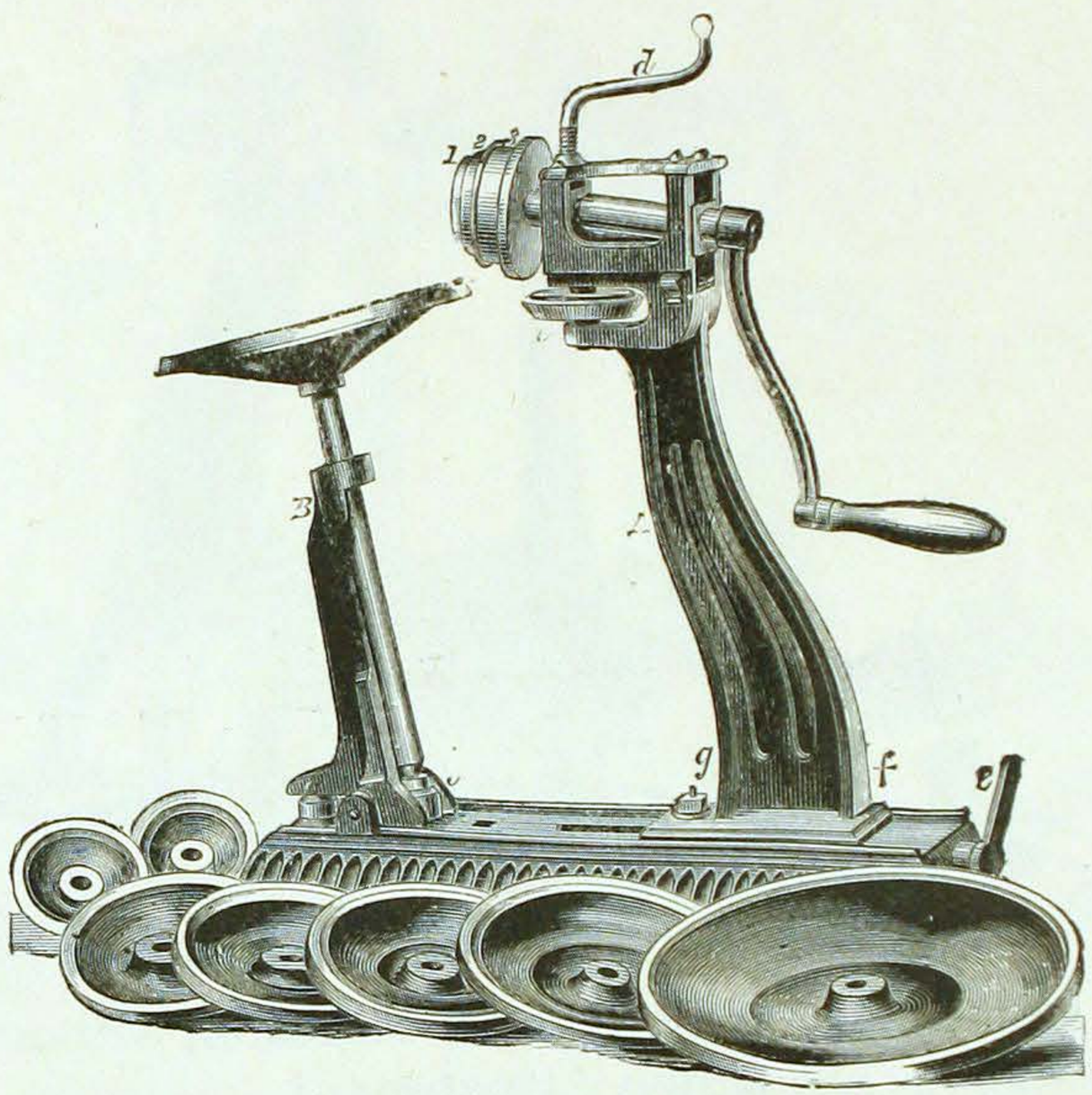
No. 15 is a Machine for which we have had several inquiries, and it is made for especially heavy work, for which a common double seamer will not answer.

No. 10. Stow's Patent Double Seaming Machine, without Setting Down $24.00

No. 15. Stow's Patent Double Seaming Machine for very heavy work, 20 inches high 50.00

Extra Heads . . . . . each 2.50

DOUBLE SEAMING MACHINES.



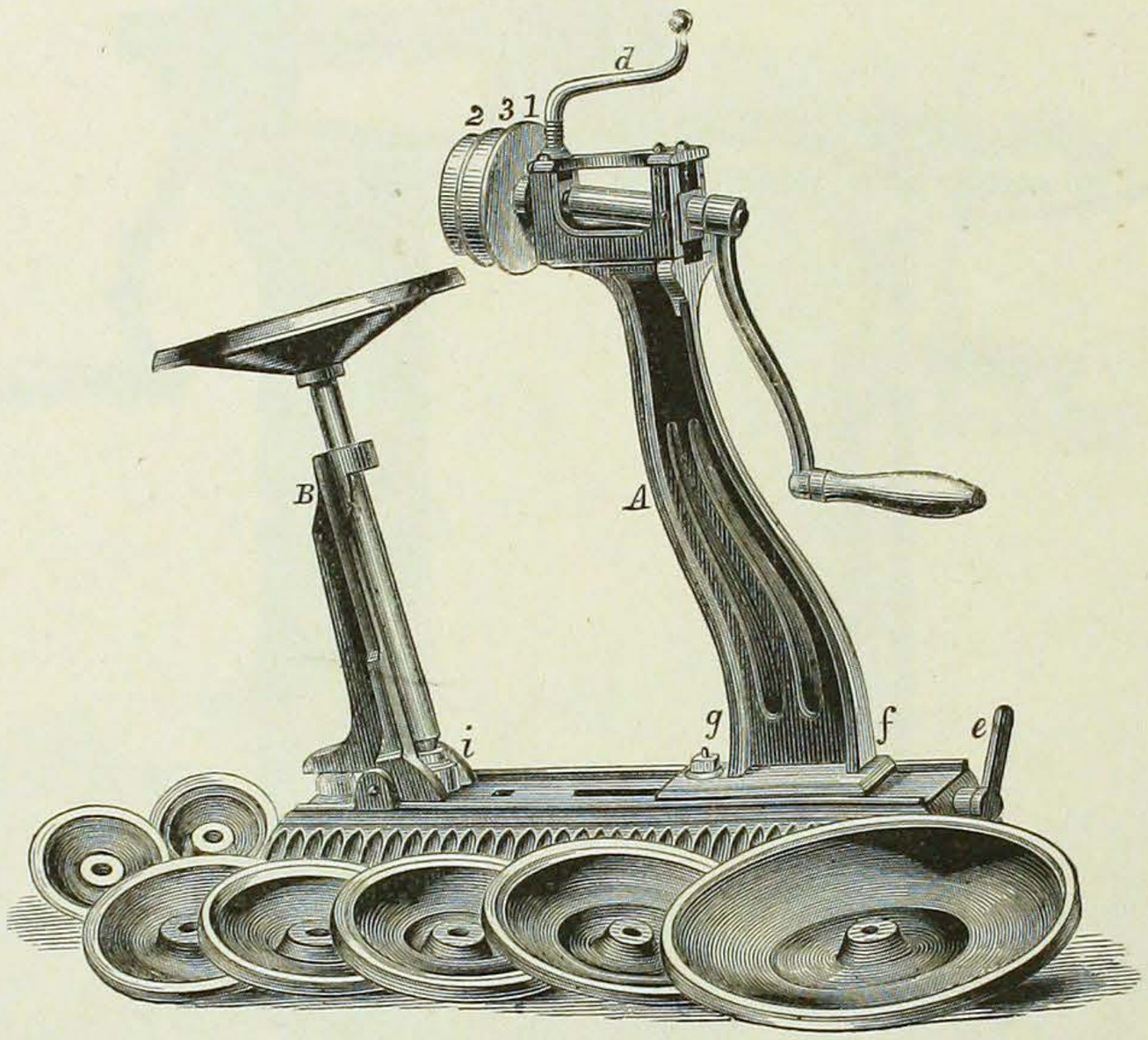
Olmsted's Setting Down, Double Seaming and Deflecting Machines.

EIGHT DISCS.

This Machine is 15 inches high, weighs 100 pounds, and is made with brass boxes and cap; it is adapted for straight or flaring work, and may be used on light or heavy Tin. It gives universal satisfaction.

No. 1. Olmsted's Double Seaming Machine, with Setting Down Attachment		$30.00
Extra Discs	each	2.00

DOUBLE SEAMING MACHINES.



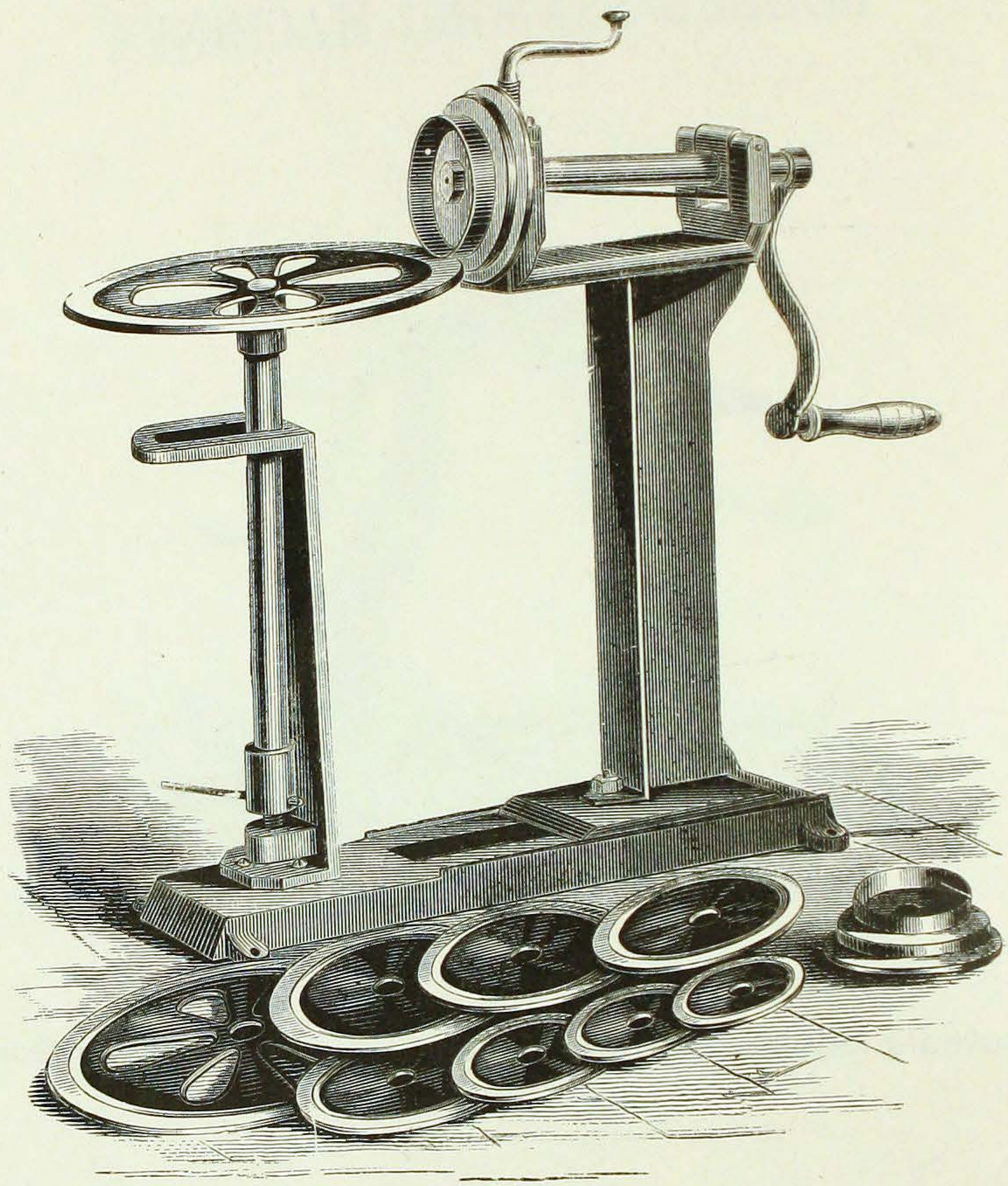
Olmsted's Double Seaming Machine, without Setting Down.

EIGHT DISCS.

This machine is similar to the one on the opposite page, but is without the Setting Down Attachment. It is 15 inches high and weighs 100 pounds. It is adapted to the same kind and variety of work.

No. 2. Olmsted's Double Seaming Machine, without Setting Down Attachment		$25.00
Extra Discs	each	2.00

DOUBLE SEAMING MACHINES.



One-sixth Size Cut.

Burton's Patent Double Seaming Machine.

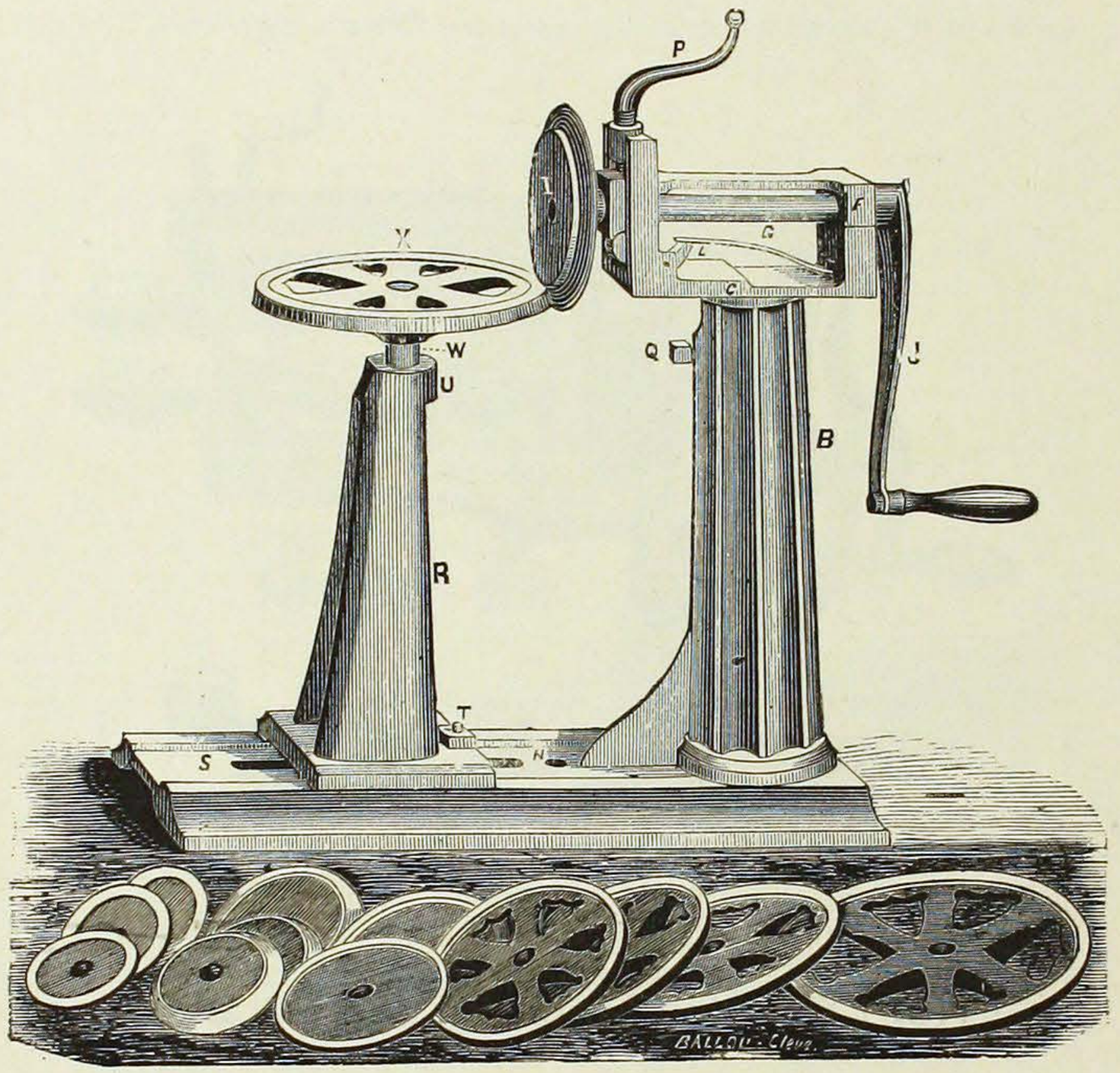
NINE DISCS.

A Deflector for stiffening Bottoms, and full sets of Discs for straight or flaring work, accompany each machine.

This Machine is especially adapted for Pans and Pails.

Burton's Double Seamer, complete		$24.00
Extra Discs	each	1.25

DOUBLE SEAMING MACHINES.



Hulbert's Patent Double Seaming Machine.

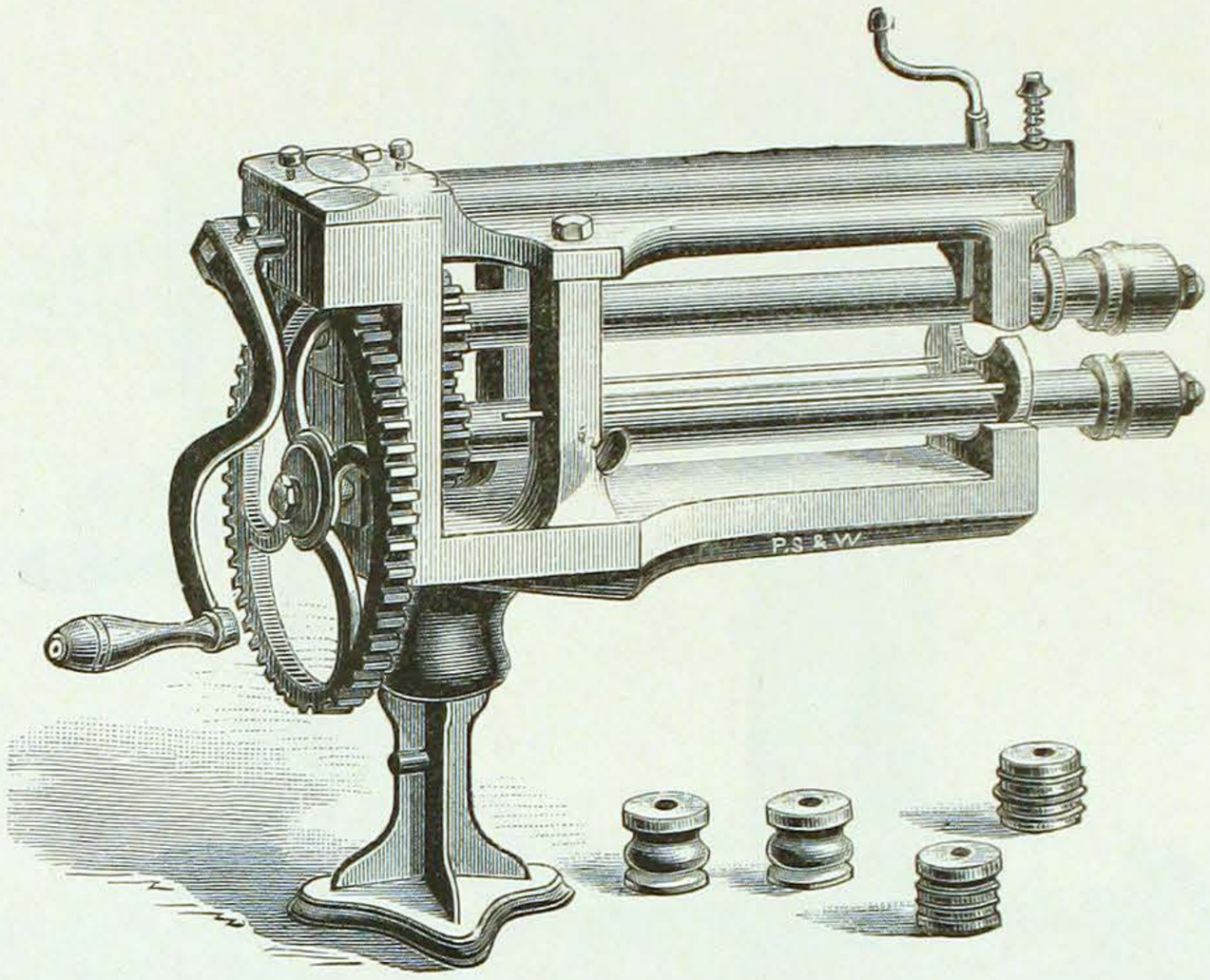
FOURTEEN DISCS.

This Machine is adapted to all kinds of flaring and straight work, Coffee and Tea Pots, Oval and Round Boilers, and raised work. It deflects the ware after it is soldered, thereby adding both strength and durability to the article.
Weight of Machine complete, with Discs, 90 lbs.

No. 1.	Hulbert's Double Seaming Machine, with Deflector . . .	$30.00
No. 2.	Hulbert's Double Seaming Machine, without Deflector . .	25.00
	Extra Discs . . . . . each	2.00

Extra Discs of any size and bevel, and duplicate parts of the Machine, furnished to order.

IMPROVED BEADING MACHINES.



No. 1 Beading Machine, with Stand.

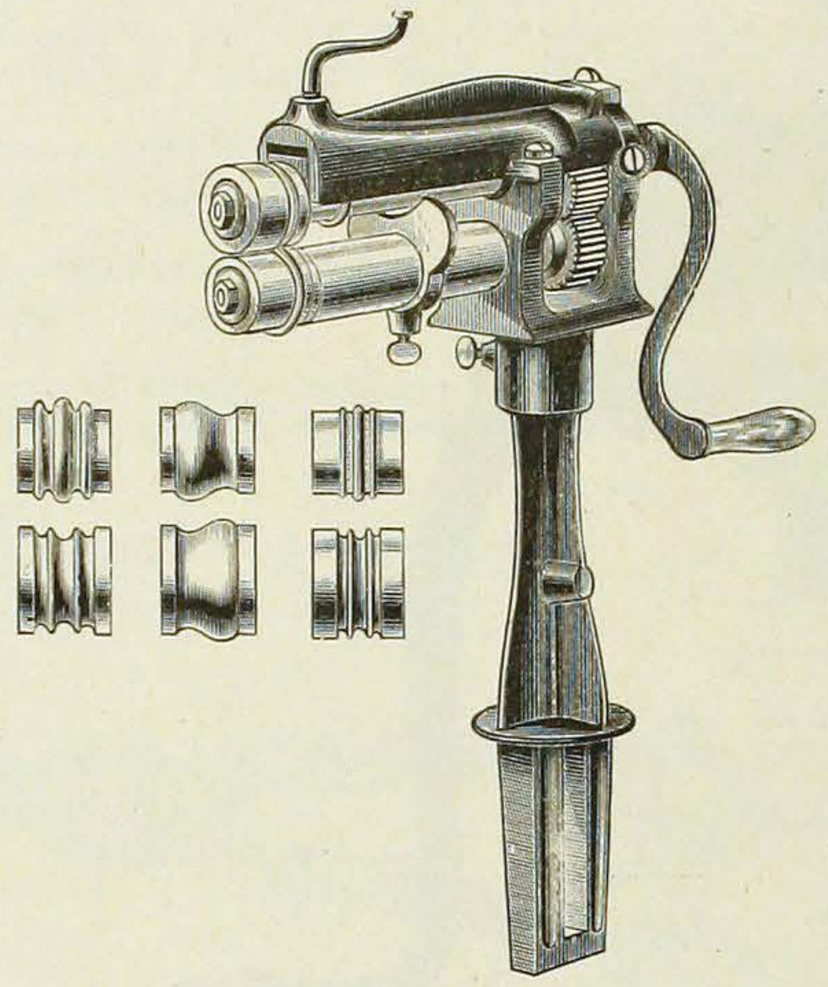
In all cases our Beaders are packed with the number of Rollers specified with the prices given below:

No. 1.	Improved, 13 in., with 3 pairs Rollers and Rotary Stand . . .	$32.25
No. 2.	Improved, 10 in., with 3 pairs Rollers and Rotary Stand . . .	31.25
No. 3.	Improved, 7½ in., with 3 pairs Rollers and Rotary Stand . . .	26.25
Extra Wrought-Iron Rollers for Nos. 1 and 2	per pair	3.50
Extra Wrought-Iron Rollers for No. 3	per pair	3.00
Extra Standards for Nos. 1, 2 and 3	each	1.25
Beader Cranks or Beader Crank Screws	each	.50

The impressions given are 1⅛ inch, 1 inch, ⅞ inch, ½ round, O. G., Coffee-pot, Cullender, Elbow, Astragal, or any form required.

BEADING MACHINES,

WITH ADJUSTABLE BOXES AND DUPLICATE PARTS.



No. 4 Beading Machine, with Stand.

O. W. STOW'S PATENT BEADING MACHINES.

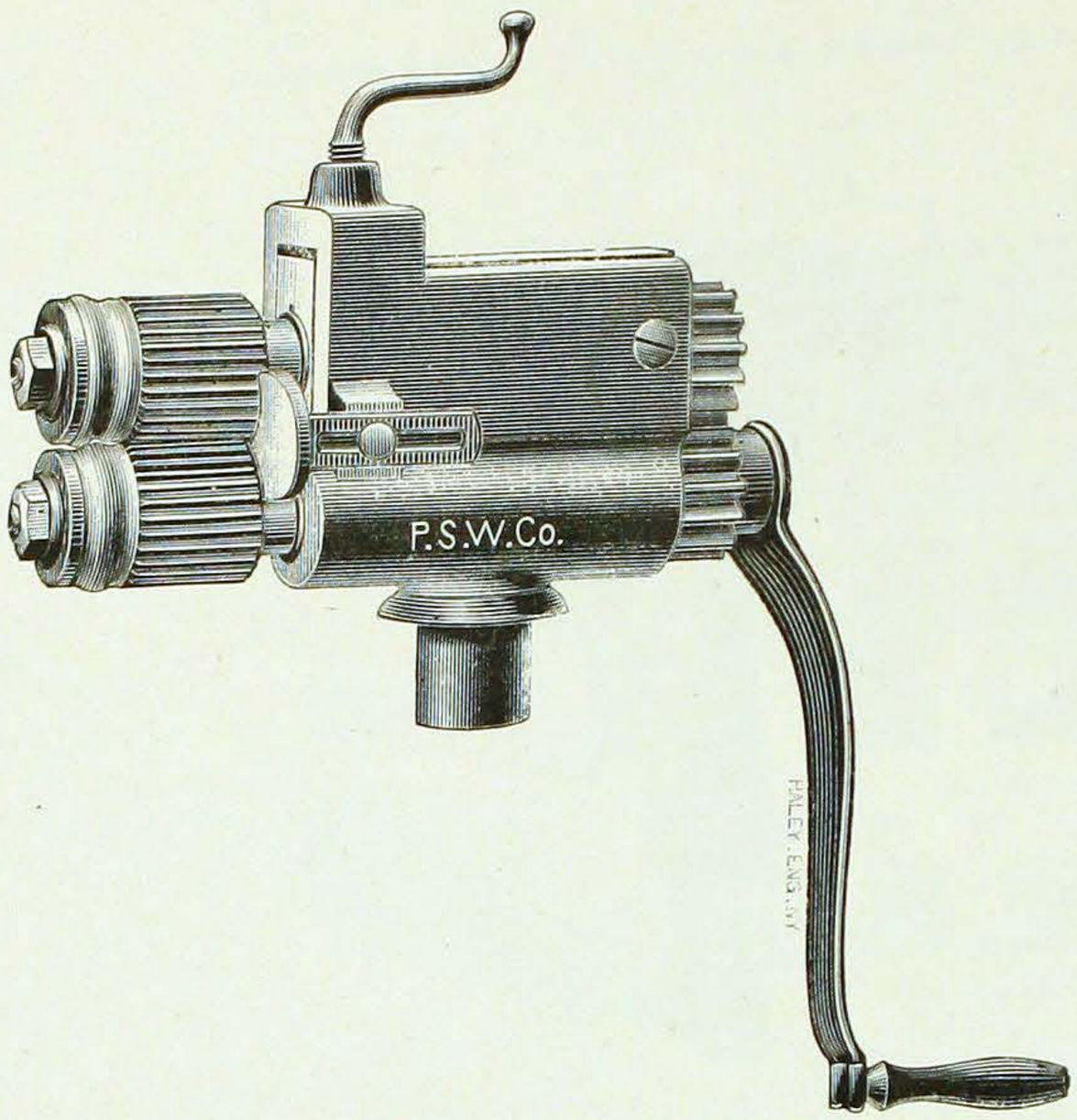
These Beading Machines are made in the same manner as our Encased Machines. All the parts are made to standard gauges, and are lettered, so that any piece can be replaced by designating the number of the Beader and the letter stamped upon the part wanted.

The four pairs of Rollers accompanying the No. 4 Beader are the single Bead, O. G. Bead, Small Triple and Large Triple Bead, as represented in the above cut.

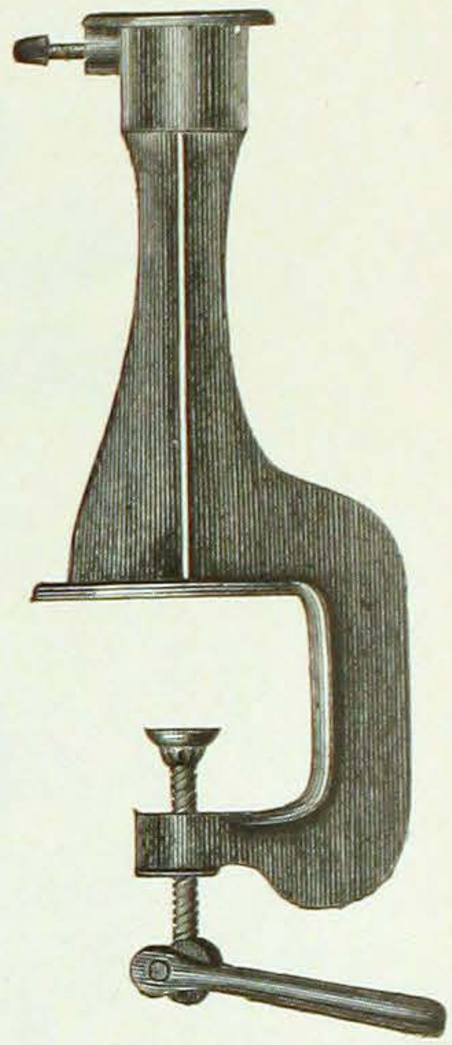
No. 4. Stow's Patent 6 in., with 4 pairs Rollers and Rotary Stand .		$19.75
No. 5. Stow's Patent 4 in., for Tin, with 5 pairs Rollers and Rotary Stand		16.75
Extra Wrought-Iron Rollers for No. 4	per pair	2.00
Extra Wrought-Iron Rollers for No. 5	per pair	1.25
Extra Stands for Nos. 4 and 5 Beaders	each	.75
Gauge for No. 4 Beader		.75

STOVE PIPE CRIMPER AND BEADER.

Patented September 16, 1873.



Crimping Machine.



Patent Standard, used with Crimping Machine.

Combined Stove Pipe Crimper and Beader.

This Machine is designed to facilitate the making and putting together of *metal pipe of different diameters.* It crimps and turns in the edges of *stove* and *conductor* pipe, so that the lengths are put together easily. It is also provided with *beading rolls*, which *bead the pipe at the same time it is corrugated.* This *Machine* is substantially and well made; it has *cut gearing* and *steel rolls.* When Crimping only is desired, substitute the Collars in place of the O. G. Rolls. It is easily adjusted and always ready for use. This Machine is made in the same manner as our celebrated *Encased Machines*—that is, the different parts are uniform and interchangeable. If any part is broken, the following list will enable the owner to substitute a new part for the defective one:

1. Cast Frame for Lower Journals.
2. " " Upper "
3. Upper Shaft.
4. Crank, or Lower Shaft.
5. Crimping Rolls, upper or lower.
6. O. G. Rolls, upper or lower.
7. Hexagon Nuts, either one.
8. Gauge.
9. Crank.
10. Cog Wheels, either one.
11. Crank Screw.
12. Gauge Screws.
13. Upper Journal Screws.
14. Collars to use in place of Beads, in case of Crimping only.

Stove-Pipe Crimper and Beader complete, with Standard . . . $12.00

TO THE TRADE.

Five years ago the Packham Stove Pipe Crimping Machine was placed upon the market and into the hands of Tinners and Stove dealers. No tool designed for the Stove dealer or Tinsmith ever gave such immediate and universal satisfaction as did this machine. From the time of its introduction the sales have steadily increased, until each succeeding year has doubled the sales of the previous one. It is the only machine having *Solid Steel Crimping Rolls Cut Spirally.*

By reason of the Spiral Crimping Rolls all danger of rupturing the grain of the metal, while crimping is avoided. *This is an Important Feature.*

The crimps on the pipe being spiral or diagonal, present to the joint more surface, giving greater friction and consequently less liability to sag.

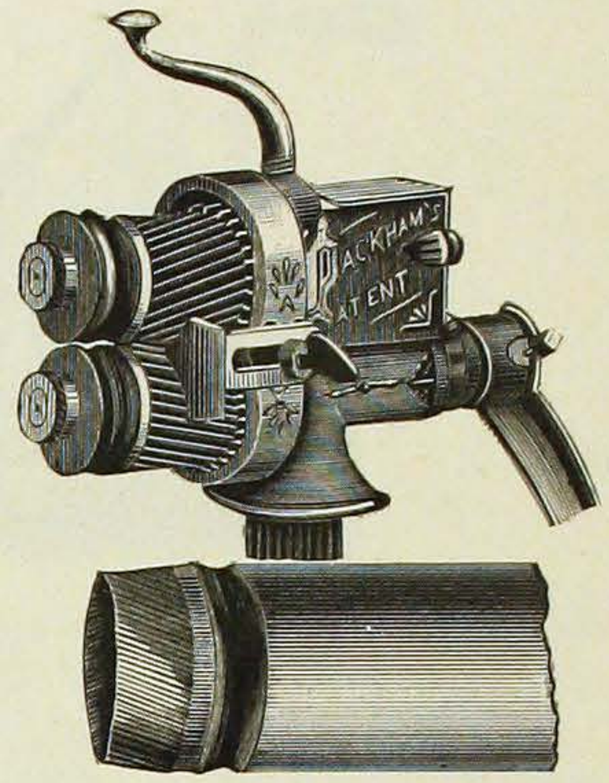
A portion of the roll is in constant contact with the metal, making a continuous and steady strain, acting upon the metal as would a pair of shears.

It saves the time and trouble of cutting the sheets tapering.

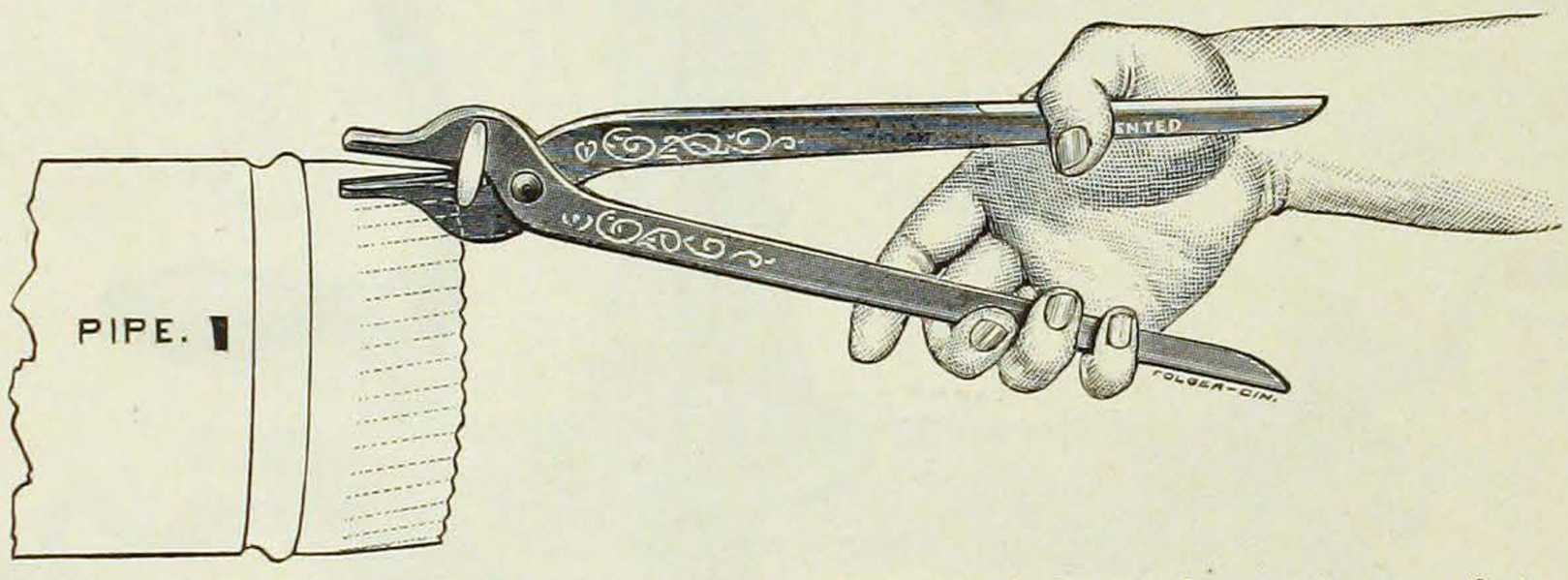
It avoids the old and tedious method of drawing in with the mallet.

It is Noisless in Operation.

It saves solder when used to fit conductor or leader pipes.



Price, with Stand $10.00



In addition to the Crimping Machine, we sell a device to facilitate the putting up of stoves while absent from the shop. It is also used in putting together sections of Galvanized iron cornice. It can be carried from place to place as easily as can a pair of snips.

In presenting Packham's Patent Crimping Tongs, we claim the *Best Device On Earth* to facilitate the putting up of stoves. Try them.

Price, per pair . . . . . 75 cents.

NEW CRIMPING ROLL.

FOR CONDUCTOR PIPE, TIN AND LIGHT METALS.

New Supplementary Roll.

SOLID STEEL. PERFECTLY MADE.

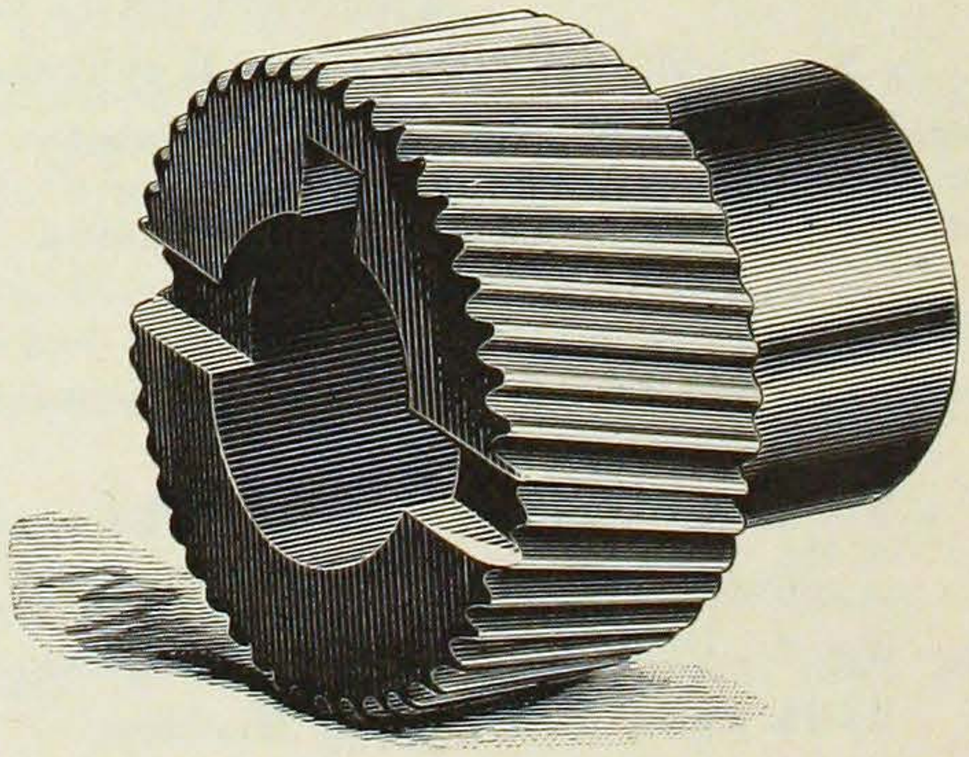
Prompted by many inquiries, we offer this season to the *Trade*, a new Roll for crimping tin and light metals.

This Roll is more especially adapted to conductor or leader pipe than the Standard Roll furnished with the machine.

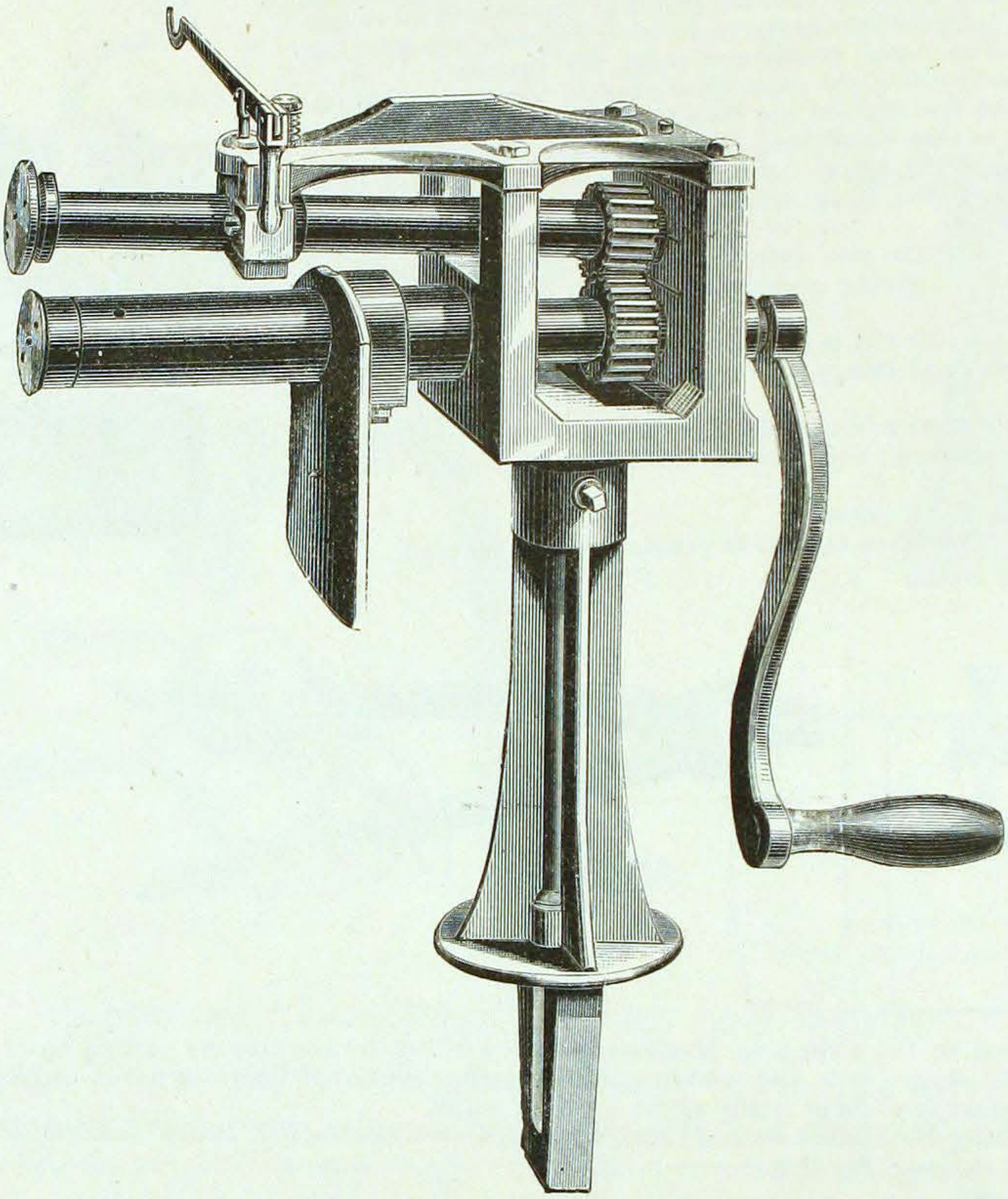
The flutes are finer and more in number, possessing the same advantages in form as the coarse fluted spirals.

These Rolls are made in pairs and will fit any No. 3 Packham Crimper.

Price, per pair $1.50



CRIMPING MACHINES.



Crimping Machine with Stand.

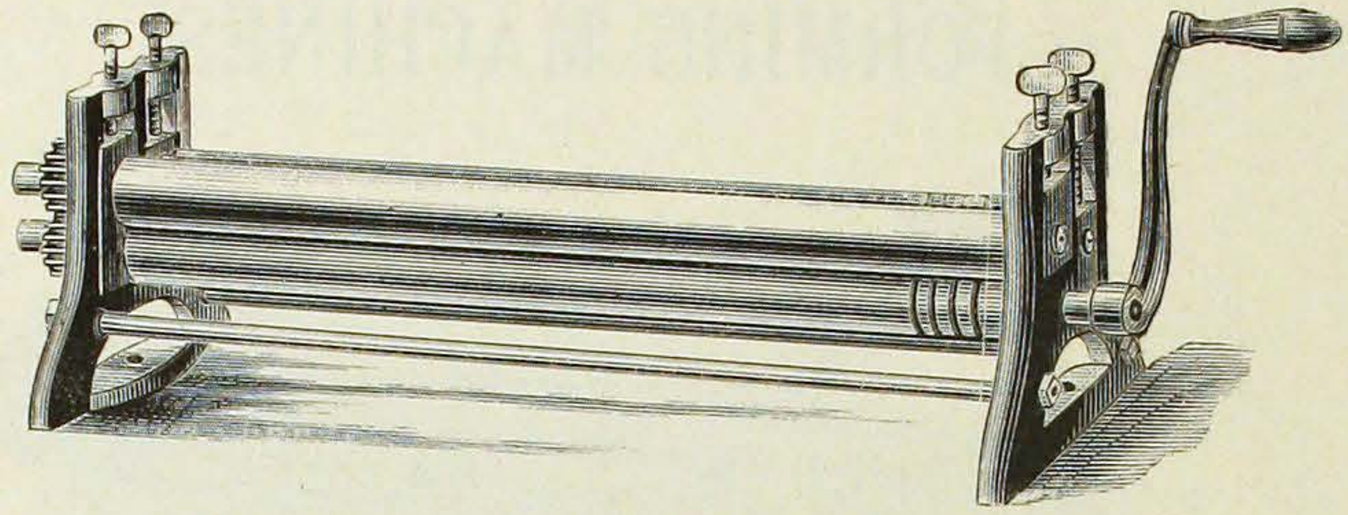
No. 1 will put bottoms on all cylinders of a diameter not less than 2½ inches, and in length not exceeding 7½ inches.

No. 2 can be used for cylinders of a diameter not less than 1½ inches, and not longer than 6 inches.

The Gauges are so arranged as to be adjusted with ease and accuracy.

No. 1. Crimping, for putting Tops and Bottoms on Boxes, Cans, Cups, etc., with Standard		$18.00
No. 2. Crimping, for similar purposes, with Standard		15.00
Extra Faces for Crimping Machines	each	1.50

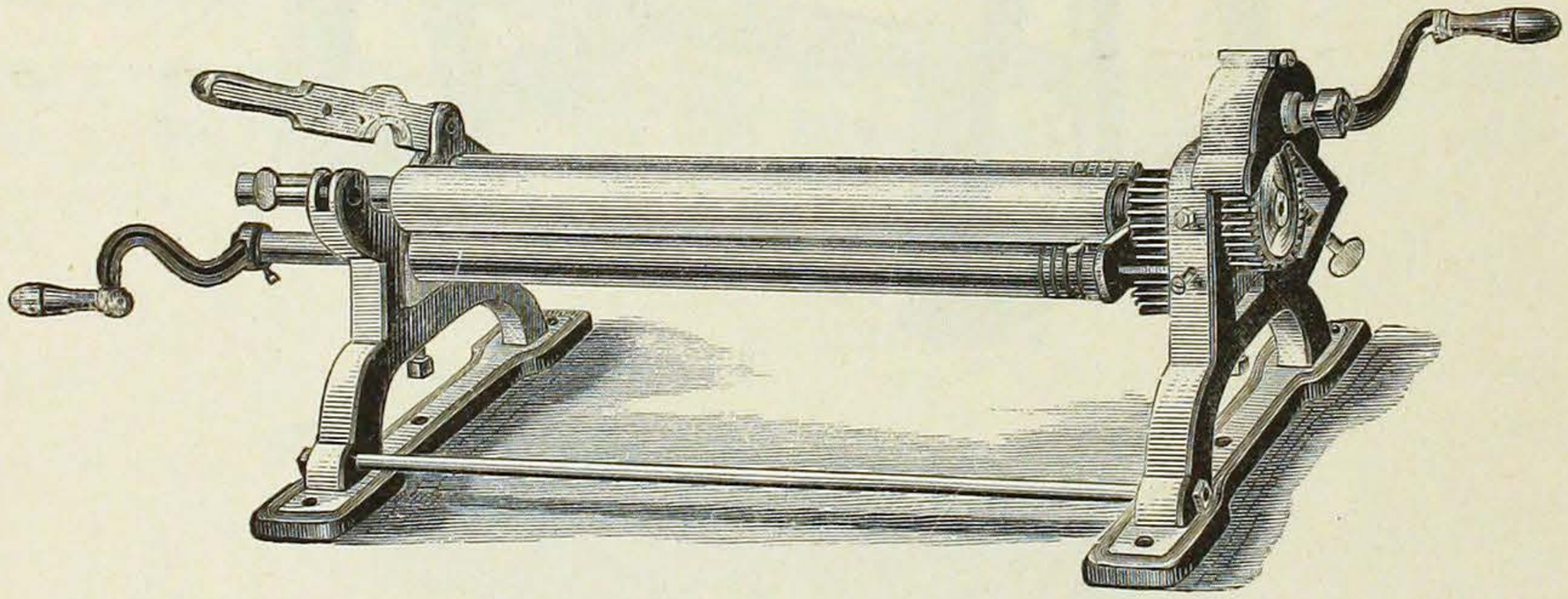
FORMING MACHINES.



Stove-Pipe Former.

These Formers are made from the best quality of *refined* iron; the rolls are turned, finely finished, and are free from indentations and imperfections.

No. 0.	For Cans, 2 inch Rolls, 37 inches long		$24.00
No. 1.	Stove-Pipe Former, 2 inch Rolls, 30 inches long . . .		19.00
No. 2.	Stove-Pipe Former, 1¾ inch Rolls, 30 inches long . . .		18.00
No. 1.	Tin Pipe Former, 1½ inch Rolls, 20 inches long . . .		10.00
No. 2.	Tin Pipe Former, 1½ inch Rolls, 16 inches long . . .		9.00
No. 5.	Tin Pipe Former, 1 inch Steel Rolls, 12 inches long . .		12.00
Gear or Cogs for Stove-Pipe Former		per pair	.50
Set of (4) Thumb Screws for Stove-Pipe Former . . .		per set	2.00



Nos. 0000 and 000 Formers.

☞ The No. 000 Former has been constructed especially for forming Tubing for Hydraulic mining, or Water Works, where the great pressure demands extra heavy iron. It is so made that the roller around which the work is formed is easily removed from its journal, and the formed pipe is taken from the end of the roller. It will form No. 14 iron. Weight, boxed for shipment, 500 lbs.

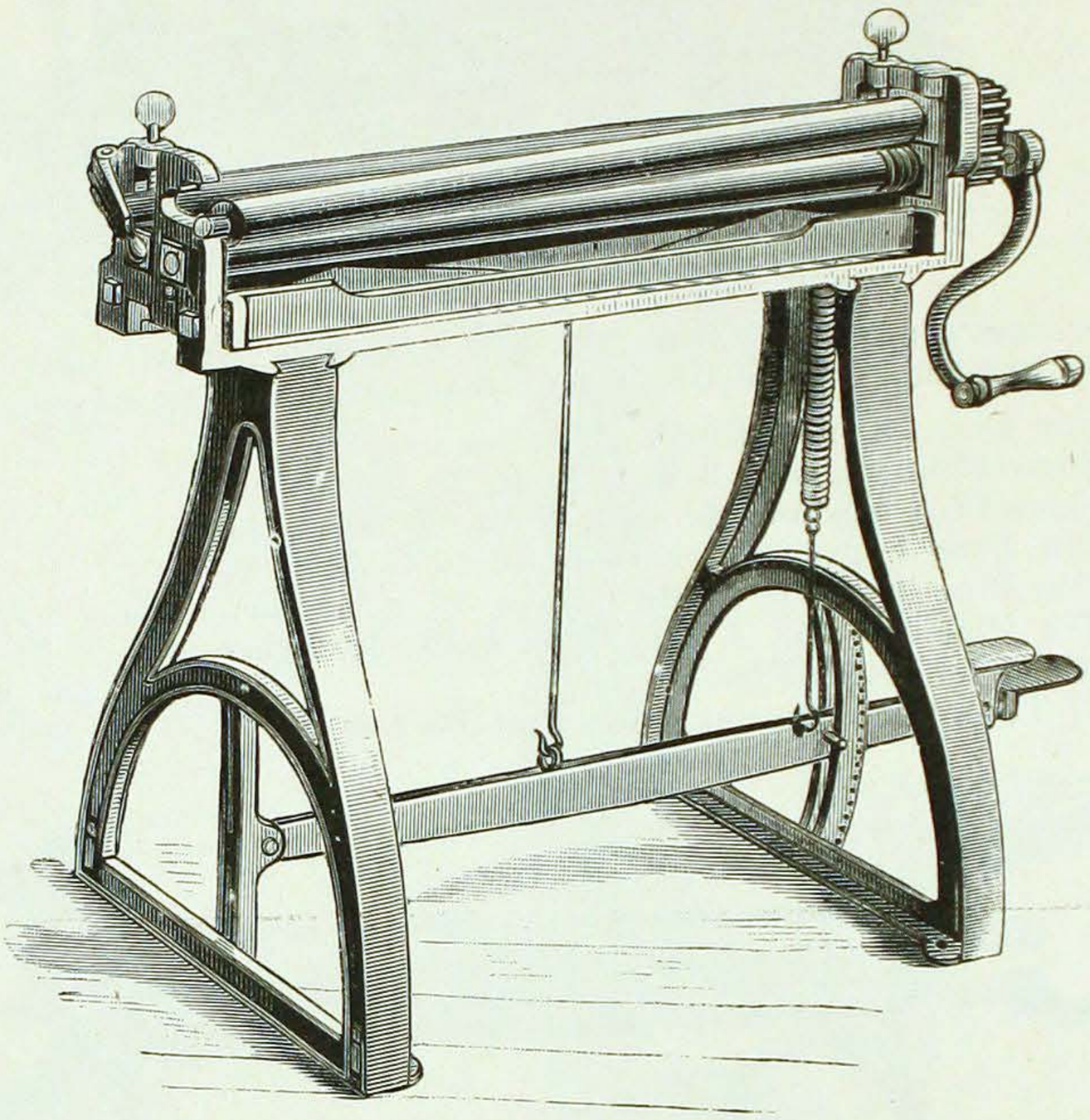
No. 0000 is made in the same manner and for the same purposes as the No. 000.

The No. 00 Former is the same, with the exception that it has not the slip-roll; it will form No. 16 iron.

No. 0000.	Extra Large, Double Geared, 4 inch Slip-Rolls, 48 inches long,	$175.00
No. 000.	Extra Large, Double Geared, 3 inch Slip-Rolls, 37 inches long,	100.00
No. 00.	Double Geared, for Heavy Plate, 3 inch Rolls, 37 inches long,	85.00

We make to order a very large variety of Formers for special work, from 20 to 72 inches in length.

FORMING MACHINES.



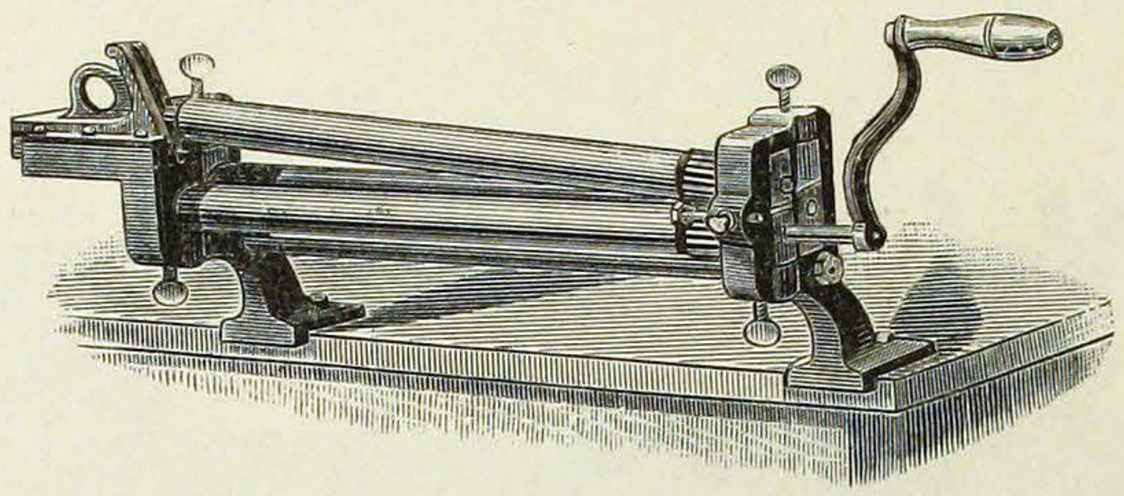
Stow's Improved Stove-Pipe Formers.

These Machines possess the following advantages over the usual style of Forming Machines:

The roller around which the work is formed is easily and quickly released from its journal, so that the formed work or pipe can be taken from the end of the roller, and not spring over it. This arrangement enables the operator to make the pipe more nearly perfect, and to form even conductor pipe on a Stove-Pipe Forming Machine. The Machine is complete, in itself, being set on standards or legs. It requires no bench, but it can be used the moment it enters the shop; and when not in use, can be put in any corner out of the way.

No. 10. Stove-Pipe Former, 2 inch Rolls, 30 inches long . . . $26.00
No. 20. Stove-Pipe Former, 1¾ inch Rolls, 30 inches long . . . 25.00

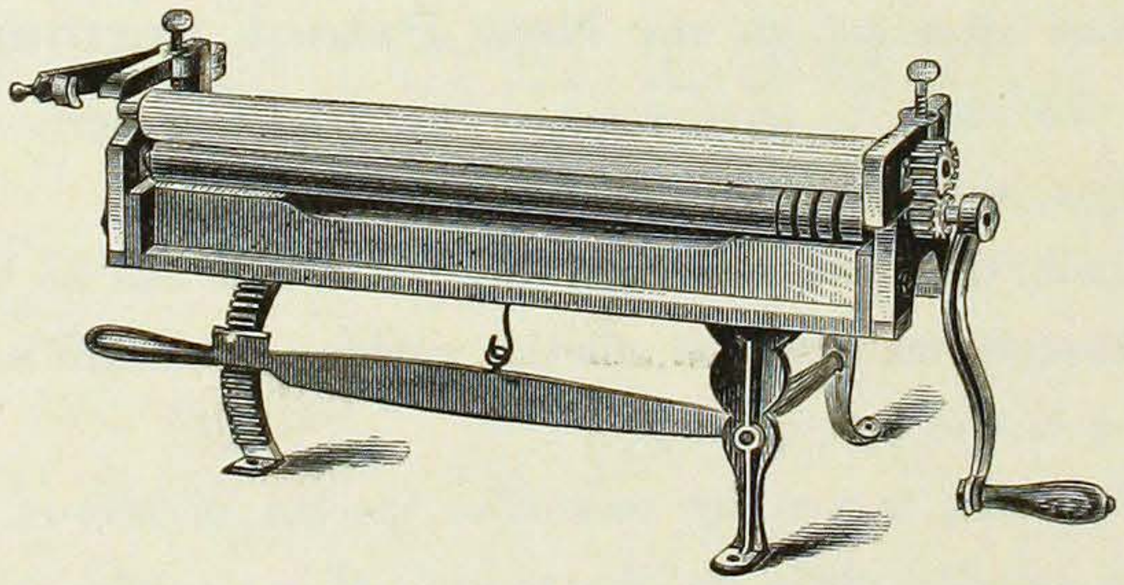
FORMING MACHINES.



Stow's Improved Tin Pipe Formers.

The Nos. 3 and 4 Tin Pipe Formers are new machines, made with slip-rolls They are excellent Machines with steel rolls and cut gear, and are well adapted for forming speaking tubes, etc.

No. 3. Tin Pipe Former, 1 inch Steel Rolls, 14 inches long . . $20.00
No. 4. Tin Pipe Former, 1 inch Steel Rolls, 20 inches long . . 30.00

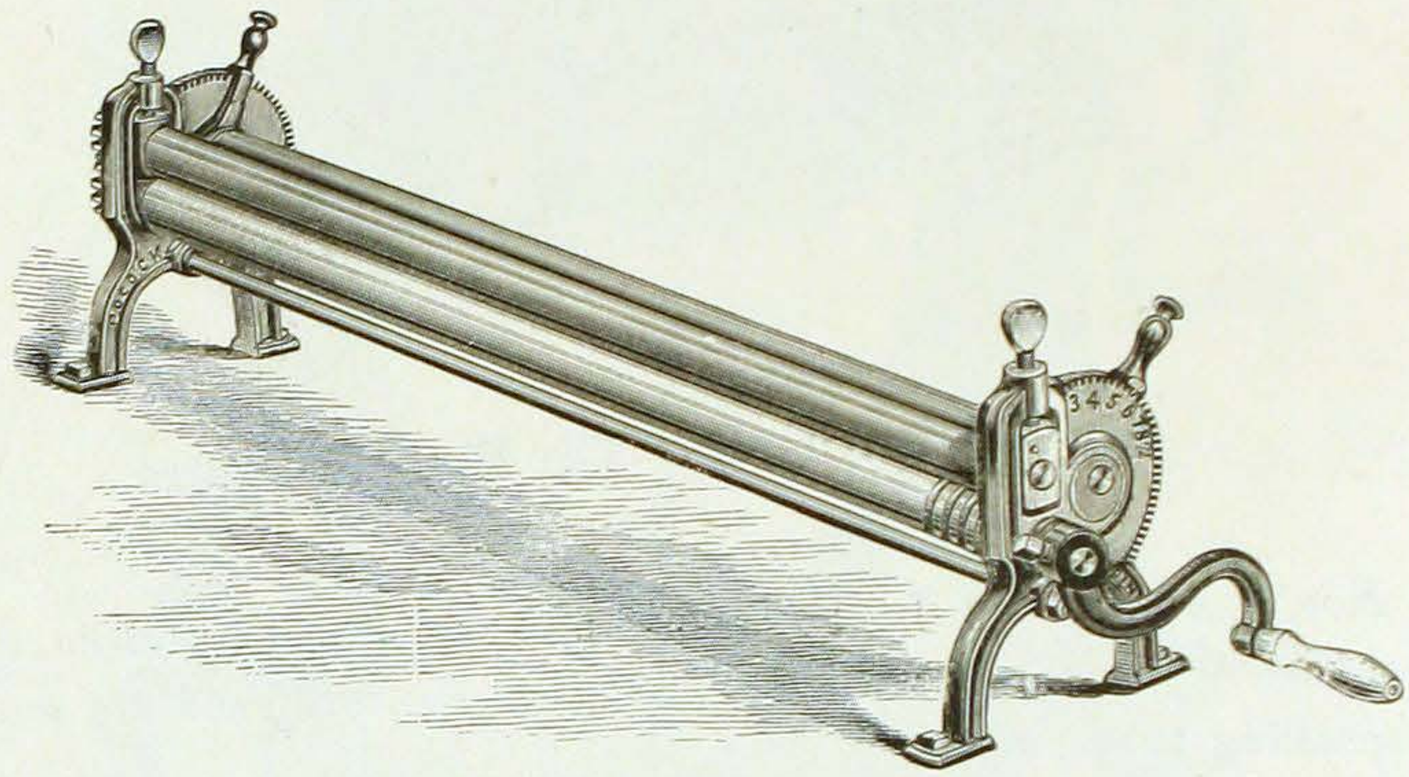


Stow's Improved Tin Pipe Former.

This Machine is also made with a slip-roll, and has similar improvements to the above.

No. 30. Tin Pipe Former, 1½ inch Rolls, 20 inches long . . . $13.00

NEW ECCENTRIC FORMING MACHINE.



Pocock's Patent.

We invite your attention to the **New Patent Former or Tinners' Rolls,** in which we claim to have reached the height of perfection in regard to rapidity of operation, superior construction, and durability.

We further claim that you can bend any circle that can be bent in either the No. 1 or No. 2 old-style machines, as all the working parts are made extra strong, the materials being of the best quality.

The back roll, being moved by eccentrics instead of screws, can be changed instantly from the smallest circle to the passing of a straight sheet (or any circle between), by one movement of the eccentrics. Also that you can flare your metal easier and better than on any other machine in use.

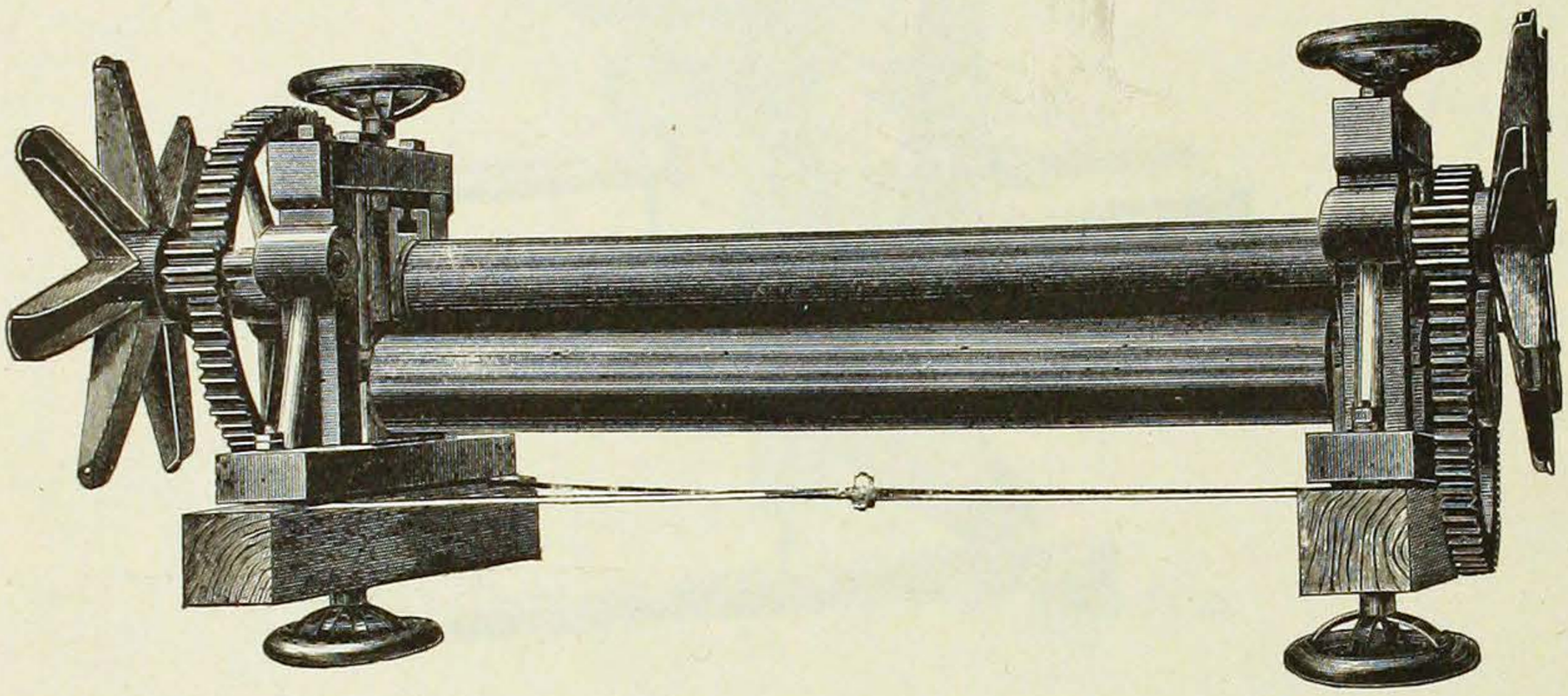
All parts duplicated, and can be had at any time.

$1\frac{3}{4}$ Rolls, $30\frac{1}{2}$ inches long . . . . . each $20.00

Discount.....

FORMING MACHINES.

FOR BOILER PLATE.



These Machines are back geared at both ends, and are first-class in every respect. Special sizes made to order.

PRICE LIST.

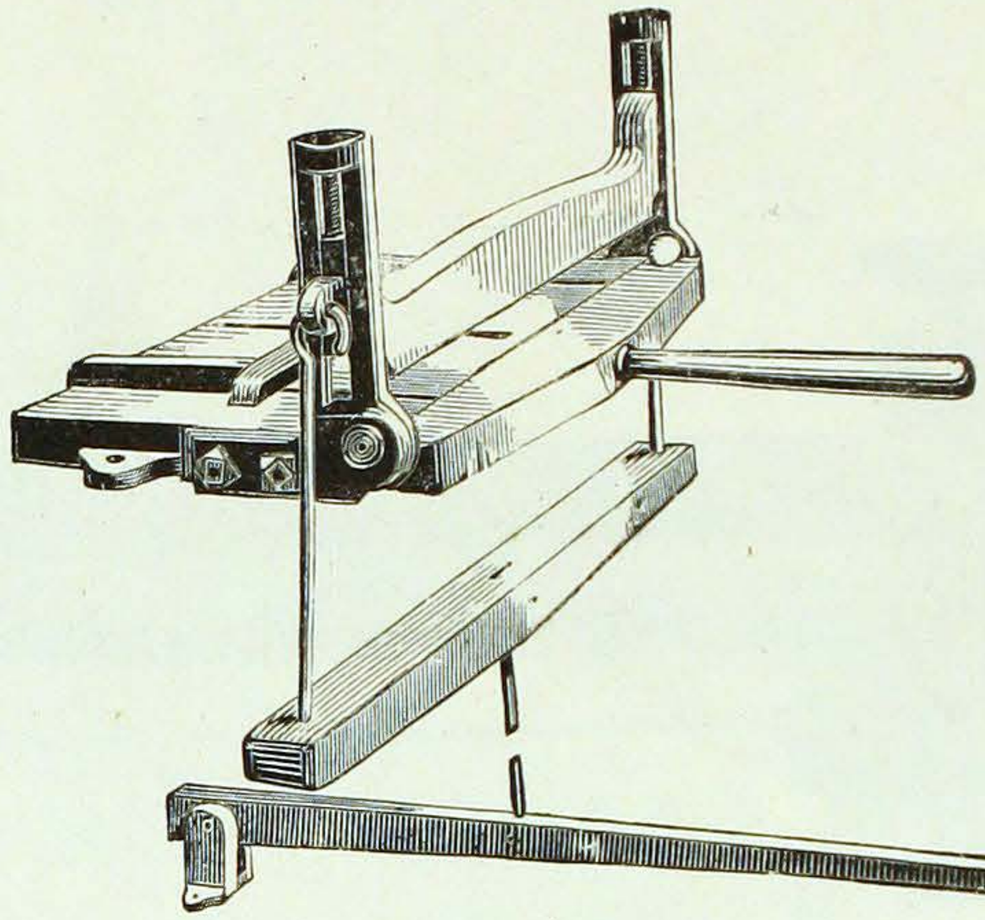
CAST IRON ROLLS.

Diameter of Roll.	Length of Rolls.	Price.
4 inch	40 inch	$100.00
5 "	40 "	120.00
5 "	50 "	150.00
5 "	62 "	175.00
6 "	62 "	220.00
7 "	62 "	280.00
7 "	74 "	325.00

Discount.....

For upper roll of Wrought Iron add 5 per cent.
For upper roll of Steel add 10 per cent.

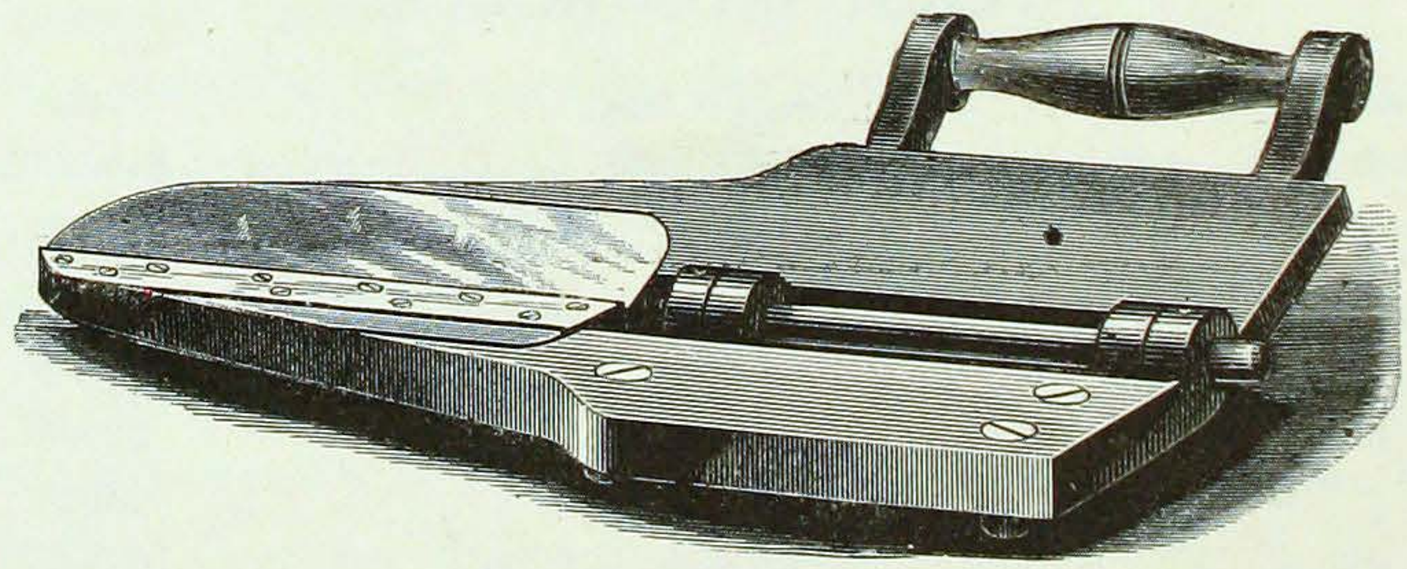
FORMING MACHINES.



Square Box and Square Pipe Folding Machine.

These are great labor-saving Machines, and are equally adapted to forming square work in the shop, or to making square Pipe for heating or other purposes.

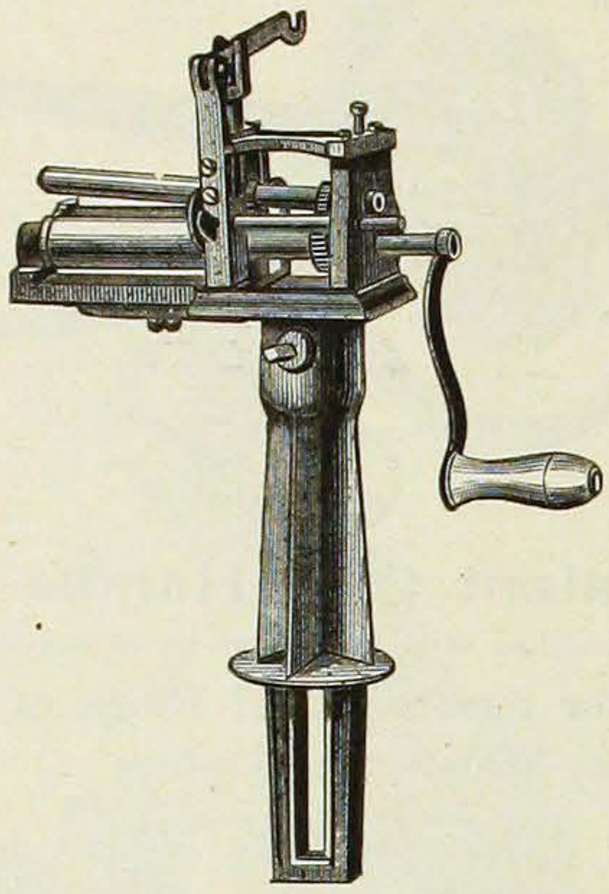
No. 1.	Square Box Folding Machine, 20 inches	$30.00
No. 2.	Square Box Folding Machine, 15 inches	20.00



Can Top Folding Machine.

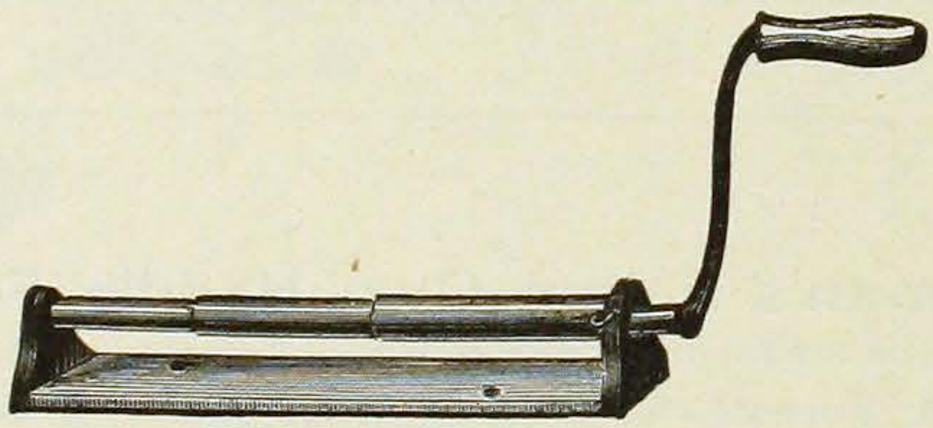
Can Top Folding Machine, for forming tops of Oil Cans. . . .	8.00

FORMING MACHINES.



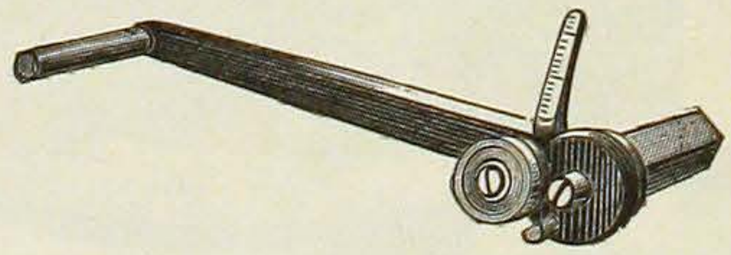
Candlestick Former and Beader.

Blacking, Pepper, or Rattle Box and Candlestick Former and Beader, Steel Rolls, $20.00



Wire Ring Former.

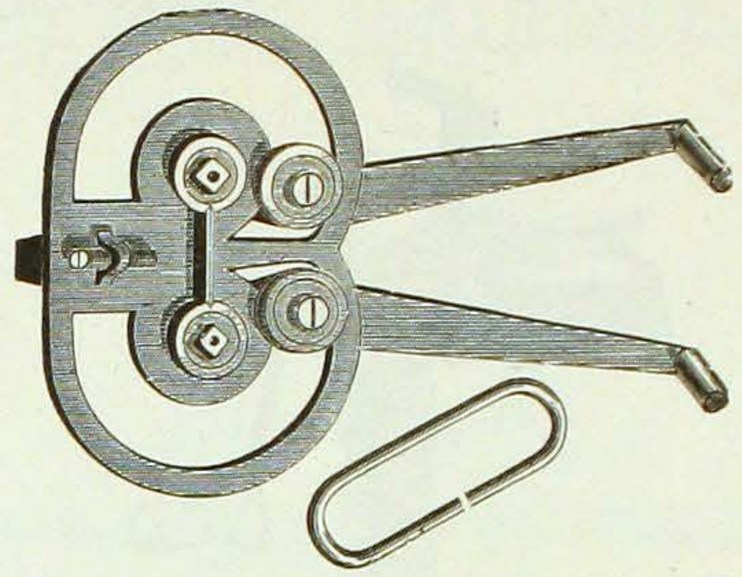
Wire Ring Former, or Winder $3.00



Miller's Patent Wire Bail Former.

Wire Bail Former, for forming Wire Bails for Pails $1.50

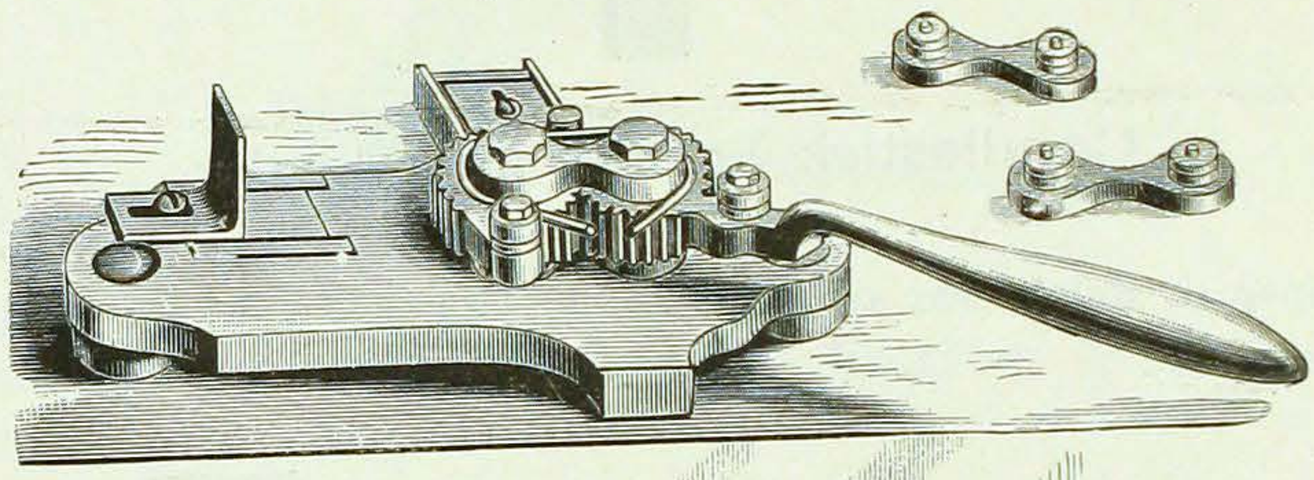
FORMING MACHINES.

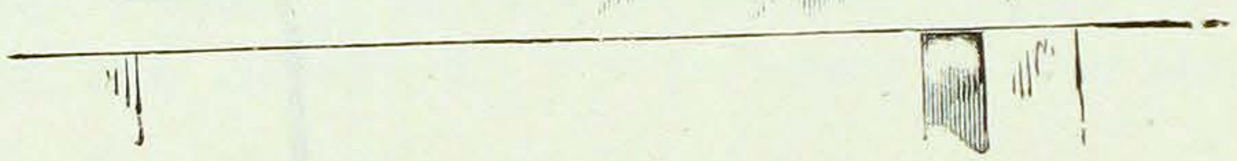


Miller's Patent Oval Handle Former.

An adjustable gauge enables the operator to form different size handles.

Miller's Oval Handle Former, for forming Oval Rings of wire $3.00
Miller's Cleat Folder, for making Cleats for Roofing 2.00

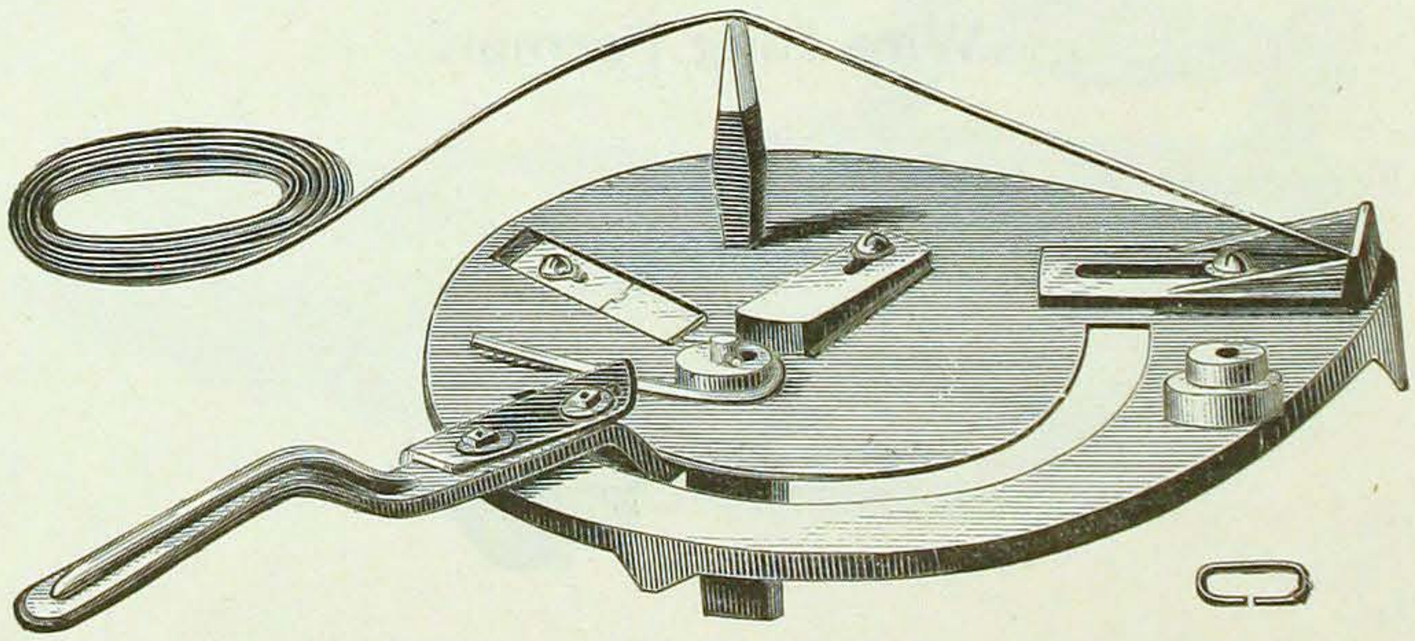




Smith's Patent Oval Handle Former.

Three sets of Rolls for forming different size handles accompany each Machine.

Smith's Oval Handle Former, for forming Oval Rings of Wire $6.00

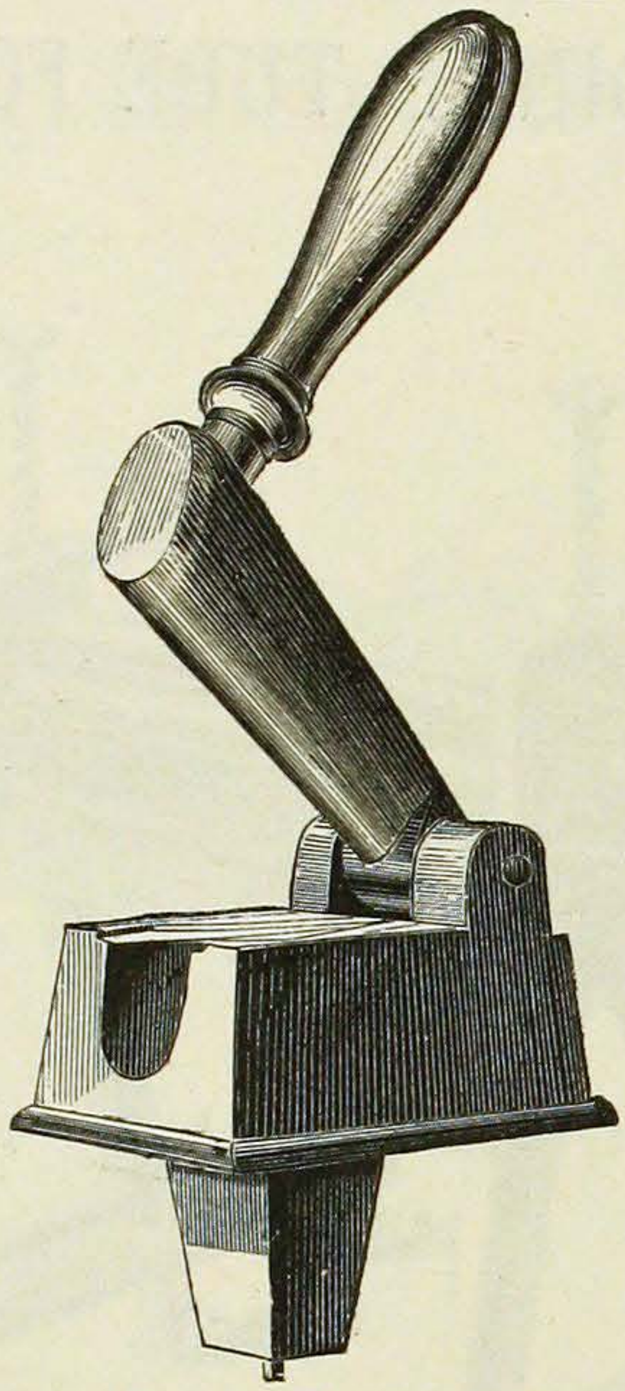


Jones' Patent Oval Handle Former.

A Gauge to measure the wire; three sets of rolls for forming different size Handles are attached to each Machlne.

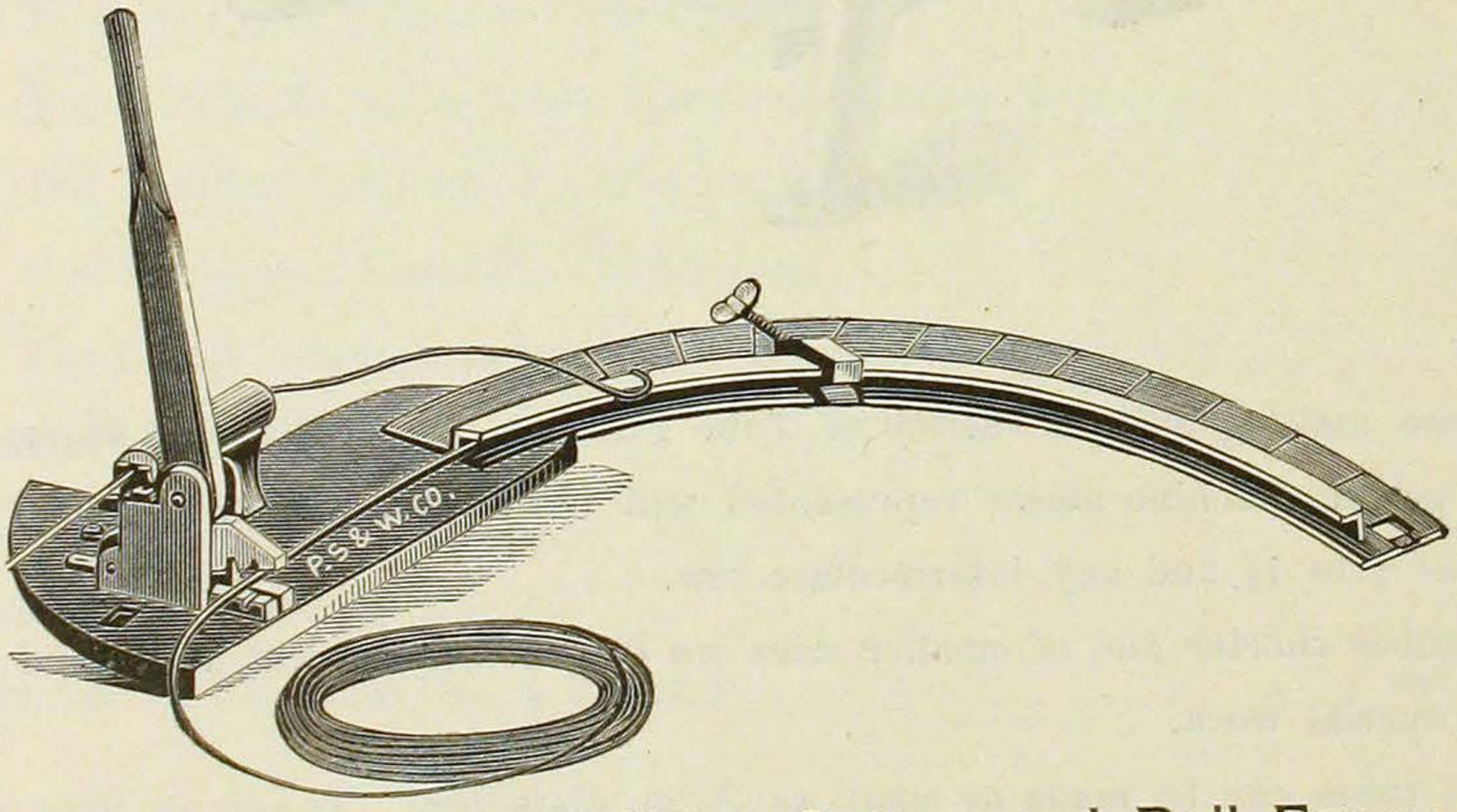
Jones' Oval Handle Former, for forming Oval Rings of Wire $6.00

FORMING MACHINES.



Boss Former.

Boss Former, for Forming Handle Braces $1.50

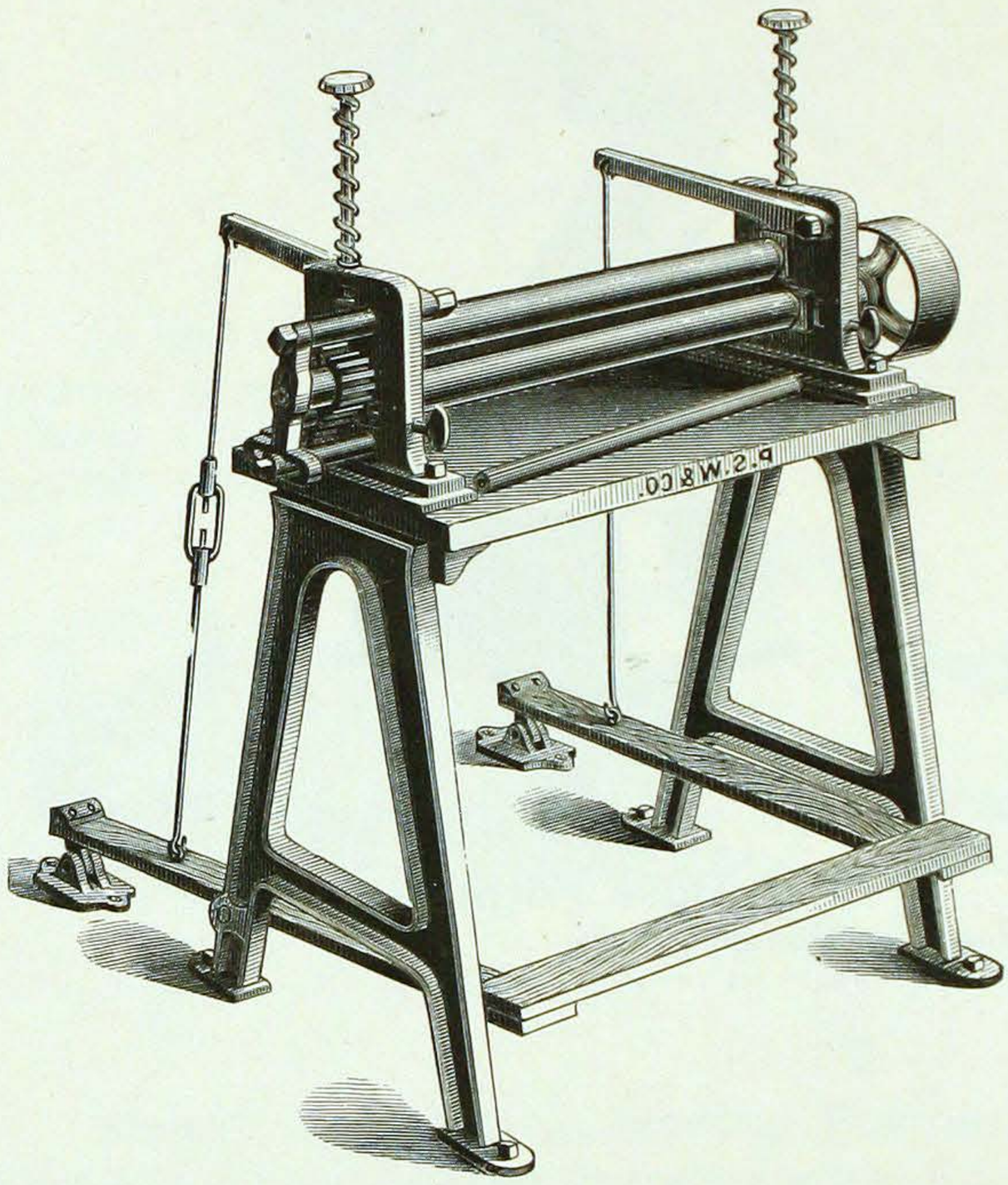


Van Bramer's Patent Wire Cutter and Bail Former.

A simple, cheap, durable, economical, and labor-saving Machine. It takes wire from the coil, and gauges and cuts it to the desired length. It cuts smoothly and easily *one-quarter inch wire,* as well as all smaller sizes. It forms Bucket Bails with rapidity and accuracy. It saves the vexations experienced by every Tinsmith in the frequent breaking of Cutting Nippers.

Van Bramer's Wire Cutter and Bail Former $10.00

SPAULDING'S TUBE FORMER.



We are making quite a variety of Tube Formers and of different capacity.

The power machine above represented will form tubes 24 in. long and of sizes as follows: $\frac{3}{4}$ to $1\frac{3}{4}$ and any intermediate size.

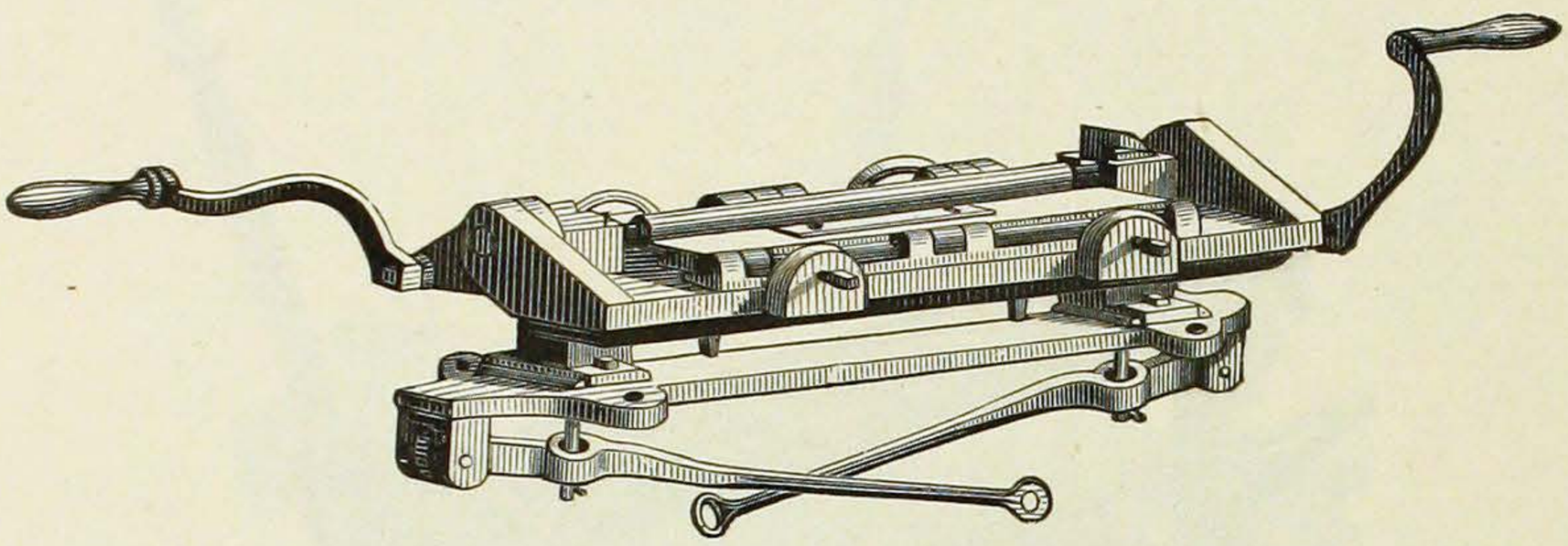
For tubes shorter and of smaller sizes we can furnish several kinds and patterns suited to special work.

Short tubes can be made as small as $\frac{3}{16}$ in. diameter. Those as long as 10 in. can be made as small as $\frac{5}{16}$ in. diameter.

In ordering it is best to send sample of the tube wanted.

Price of Spaulding Machine with one Forming Wood Roll . . .		$75.00
Extra Forming Rolls	each	1.75

TUBE FORMERS.



Stow's Patent Tube Former.

No. 00.	To form Speaking-Tubes, 24 inches long	$60.00
No. 0.	To form tubes, 15 inches long	30.00
No. 1.	For Candle-Moulds or Ladle-Handles, 11 inches long	25.00
No. 2.	For Tea-Kettle Spouts, &c., 8 inches long	20.00
No. 3.	For Rattle-Box Handles, 5 inches long	20.00
No. 4.	For Lamp-Tubes, 2½ inches long	25.00
Extra Die Rod and Bed for No. 00		6.00
Extra Die Rod and Bed for No. 0		4.00
Extra Die Rod and Bed for No. 1		3.00
Extra Die Rod and Bed for Nos. 2, 3, and 4	each	2.00

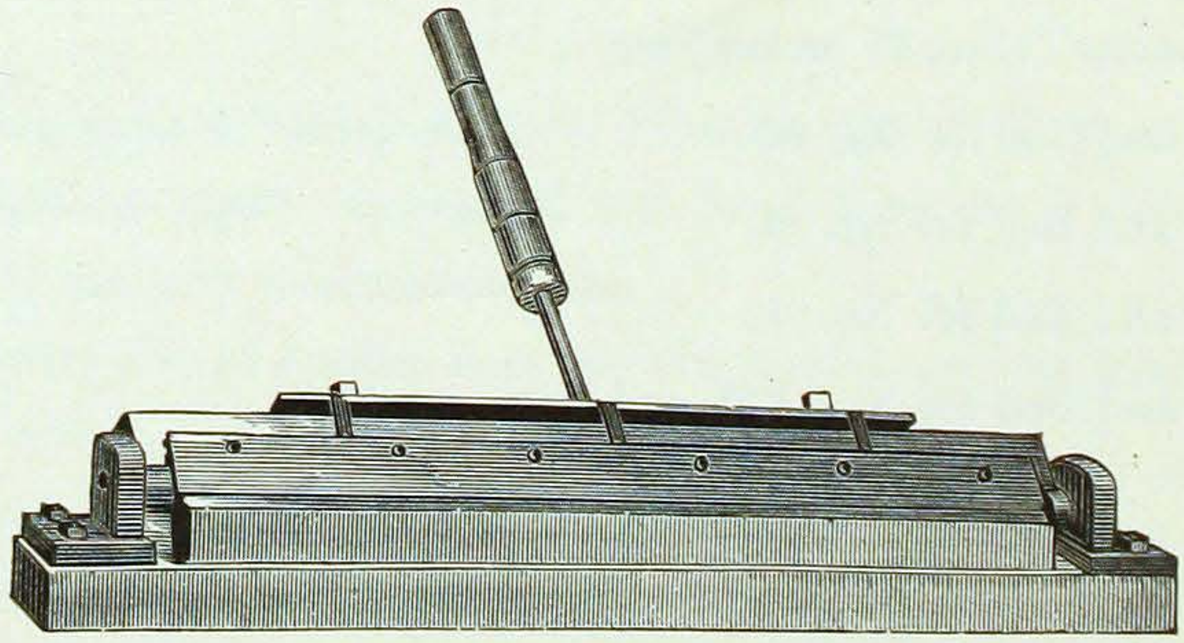
A large variety of Rods and Beds for special work at extra prices.

SHEET-IRON FOLDING MACHINES.



Wright's Patent Sheet-Iron Folder. Improved.

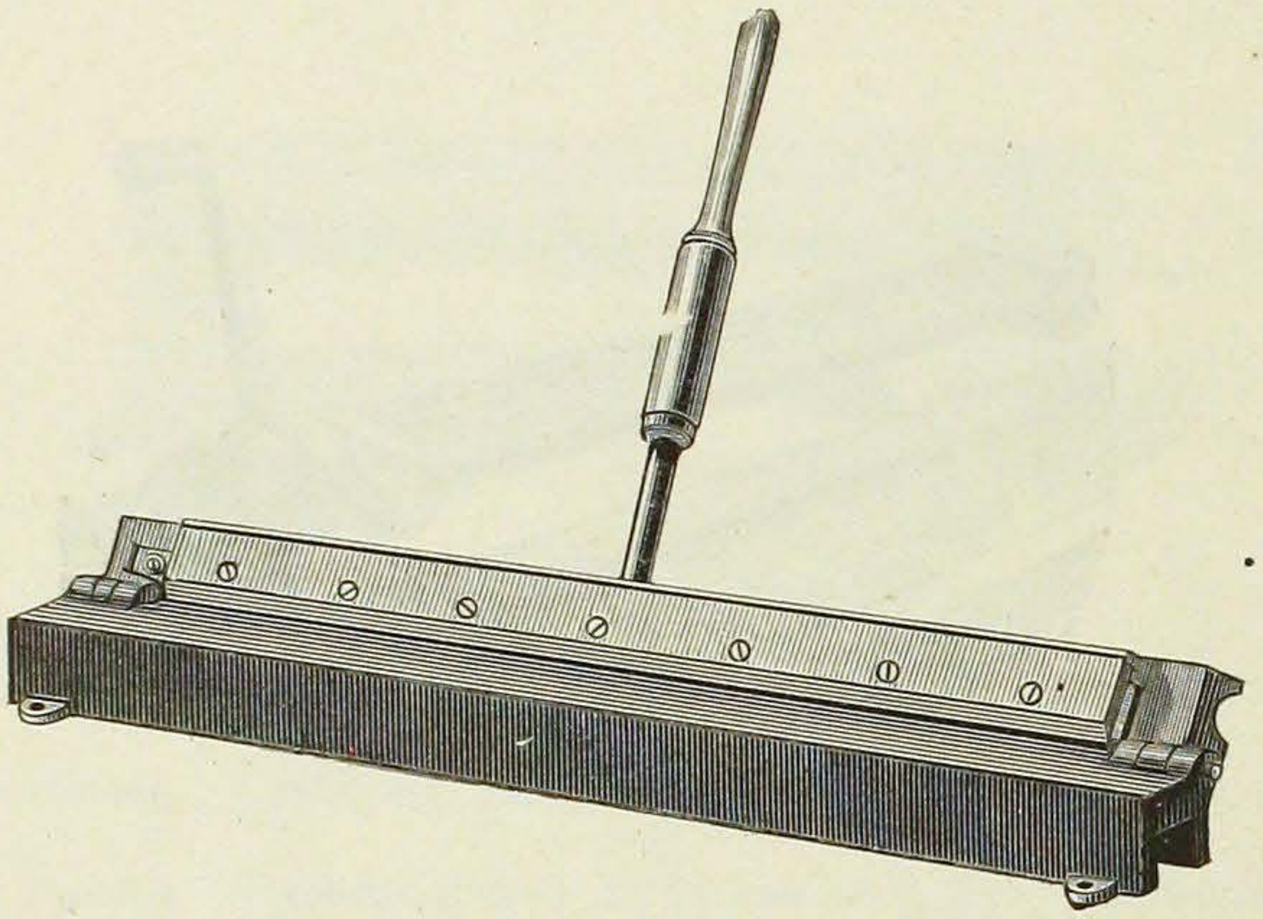
No. 0.	Wright's Patent Sheet-Iron Folder, 42 inches	$20.00
No. 1.	Wright's Patent Sheet-Iron Folder, 30 inches	12.00
	Wright's Patent Sheet-Iron Folder, Improved, 30 inches . . .	16.00



Wood Bottom Sheet-Iron Folder.

No. 0.	Wood Bottom Sheet-Iron Folder, 48 inches	$20.00
No. 1.	Wood Bottom Sheet-Iron Folder, 30 inches	10.00

SHEET-IRON FOLDING MACHINES.



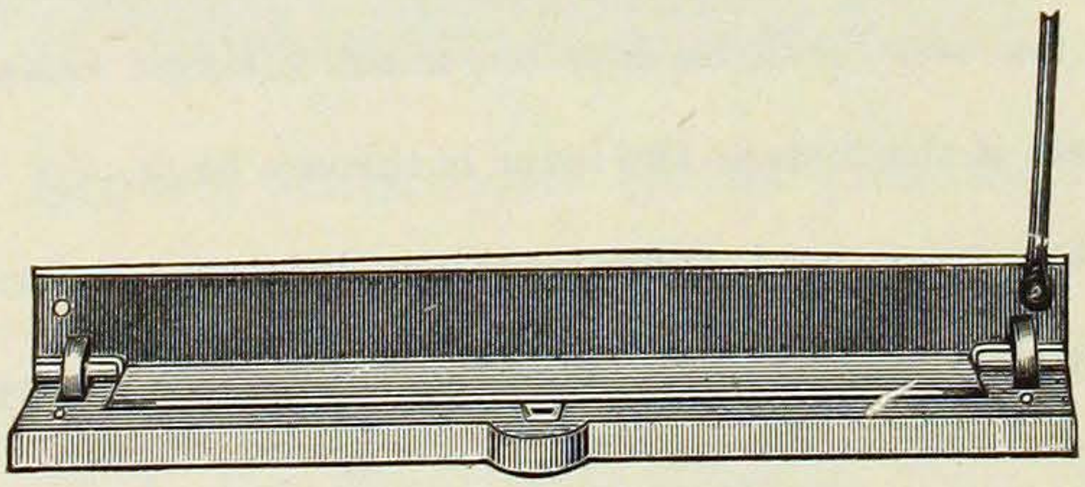
Stow's Improved Sheet-Iron Folder.

Will turn edges from $\frac{3}{16}$ to $\frac{3}{8}$ of inch in width,

These Machines are so constructed that the Gauge always moves upon a line parallel with the edge of the Folding Plate. The principle of folding is the same as in the Wood Bottom Folder. We consider it the easiest and most accurate working Machine in the market.

No. 25 is constructed on the same principle as the other Machines, but is extra heavy, and will turn edges on Iron No. 20 Gauge, from a $\frac{1}{4}$ to $2\frac{1}{4}$ inches in width, and at any angle.

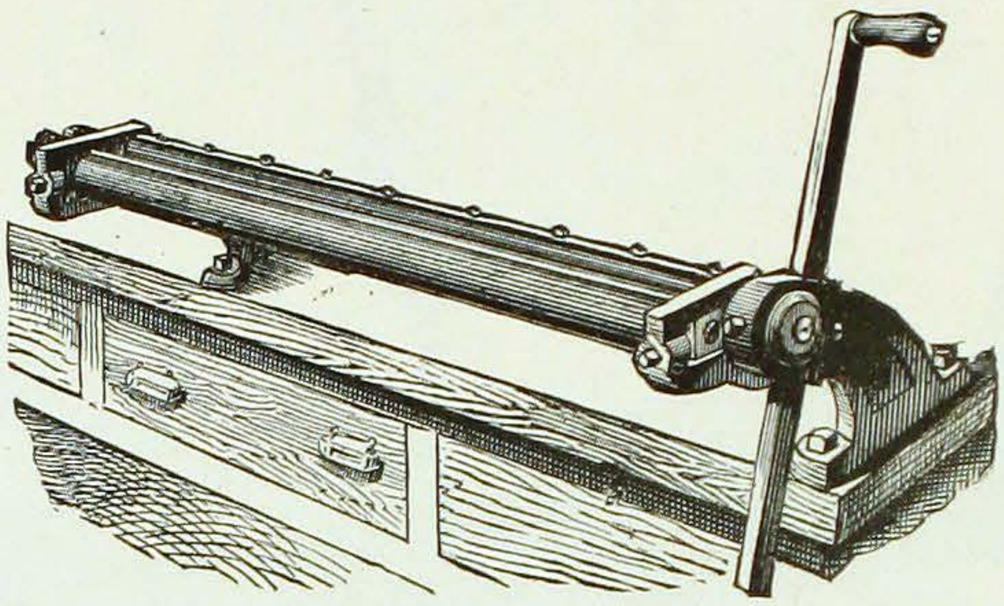
No. 10.	Stow's Sheet-Iron Folder, 30 inches	$10.00
No. 15.	Stow's Sheet-Iron Folder, 42 inches	18.00
No. 20.	Stow's Sheet-Iron Folder, 60 inches	25.00
No. 25.	Stow's Sheet-Iron Folder, 42 inches	80.00



Iron Bottom Sheet-Iron Folder.

No. 2.	Iron Bottom Sheet-Iron Folder, 30 inches	$7.00
No, 3.	Iron Bottom Sheet-Iron Folder, 39 inches	12.00

ROACH'S PATENT FOLDER.

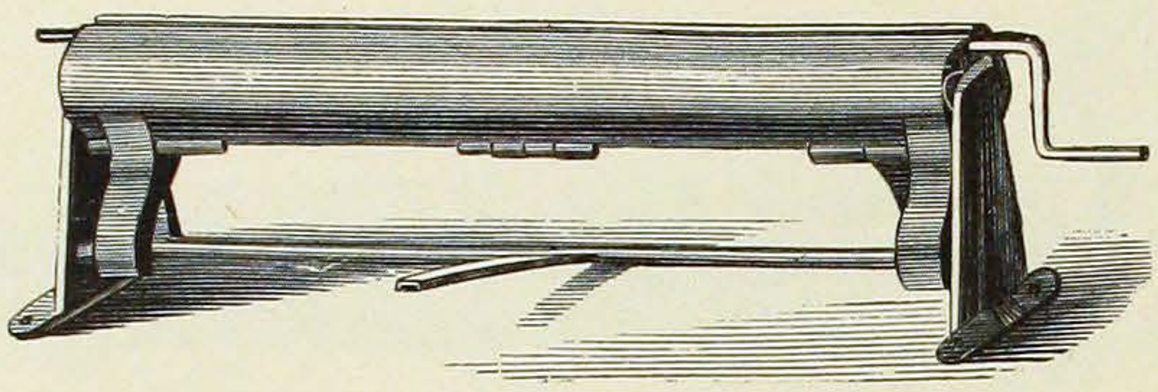


This Machine differs from all other machines, in that it has a reciprocating motion. In operating, the blade bar and bending bar (in all other machines the bending bar is stationary) meet one another half way, working by means of segment cogs, This motion has the desired effect of holding the metal in position beneath the blade, doing away with the extra clamping motion. Another attachment, which well adapts the machine for roofing tin, is the radial slot at left for receiving a stop bolt, to be used in turning second or traverse locks. A stout pin is fitted in bottom of blade bar in line with stop bolt, the stop bolt being movable in radial slot. In folding roofing tin, the operator should turn the first pair of reverse locks on all, then adjust the stop bolt so that in turning the traverse locks, he does not mash the first locks. The machine turns the sheet and releases it the instant the lever is thrown back,

The gauge is stationary on all these machines, being made for standard lock $\frac{3}{8}$ wide, thus avoiding the trouble and mistakes caused by adjustable gauges.

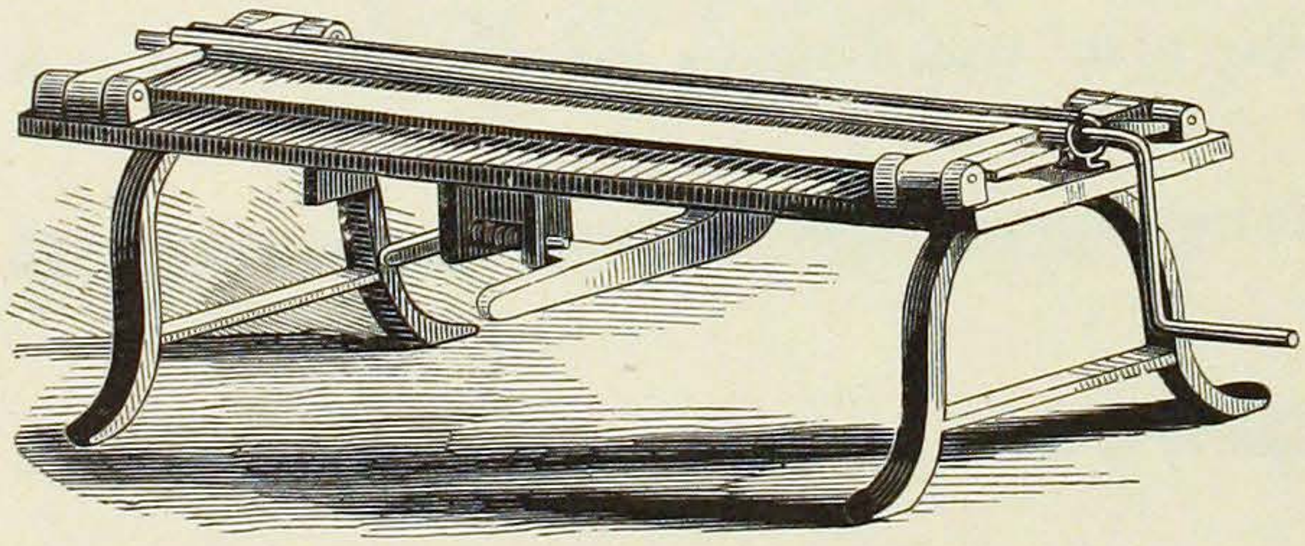
No. 00.	Roach's Patent Folder, 42 inch	$21.00
No. 0.	Roach's Patent Folder, 36 inch	18.00
No. 1.	Roach's Patent Folder, 30 inch	15.00

GUTTER MACHINES.



Stow's Patent Gutter Beader.

No. 00.	Stow's Patent.	Cast-Steel Rod, 72 inches long, $\frac{7}{8}$ or 1 inch diameter .	$35.00
No. 0.	Stow's Patent.	Cast-Steel Rod, 30 inches long, $\frac{1}{2}$ or $\frac{3}{4}$ inch diameter .	10.00
No. 1.	Stow's Patent.	Cast-Steel Rod, 20 inches long, $\frac{3}{8}$ to $\frac{5}{8}$ inch diameter .	5.50
No. 2.	Stow's Patent.	Cast-Steel Rod, 15 inches long, $\frac{5}{16}$ to $\frac{1}{2}$ inch diameter .	4.50

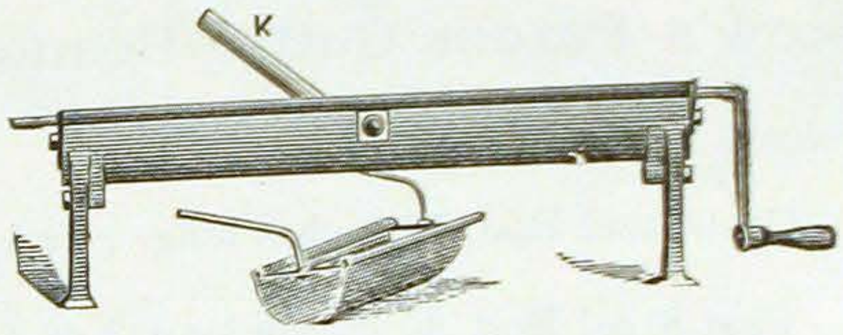


Stow's Improved Gutter Beader.

No. 10.	Stow's Improved.	Cast-Steel Rod, 20 inches	$5.50
No. 20.	Stow's Improved.	Cast-Steel Rod, 15 inches	4.50

In ordering Gutter Beaders, always specify the size of Rod wanted.

THE HAUCKE PATENT GUTTER BEADER.

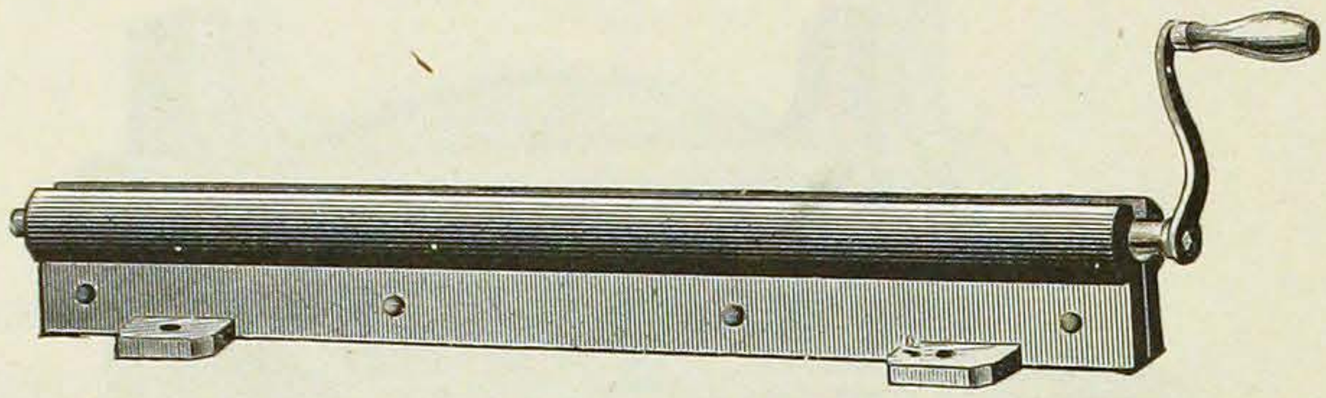


In introducing to the trade Haucke's Patent Gutter Beader, it is believed that it supplies a demand which has never before been met.

It is also believed to be the only Machine that will either bead tin or galvanized iron without changing any parts of the Machine. The Machine is 30 inches long, for either 28 inch tin or galvanized iron.

30 inch, $\frac{7}{16}$ rod $12.00

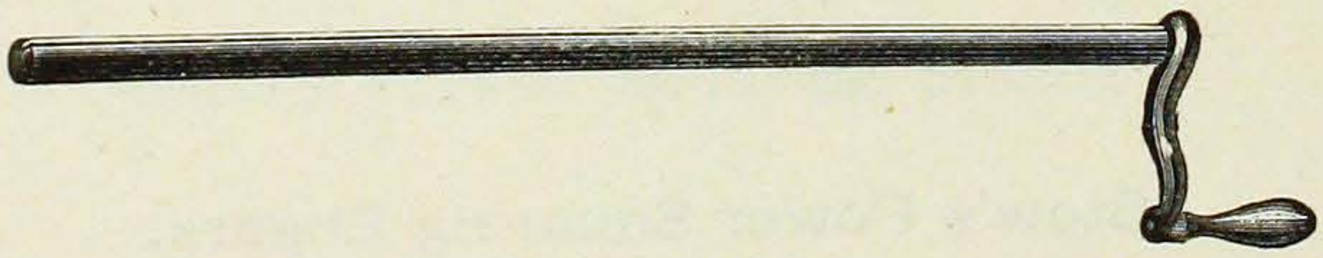
GUTTER MACHINES.



Iron Bottom Gutter Beader, with Enclosed Rod.

No. A1.	Iron Bottom, with Enclosed Rod, 60 inches	$20.00
No. 01.	Iron Bottom, with Enclosed Rod, 42 inches	9.00
No. 02.	Iron Bottom, with Enclosed Rod, 30 inches	6.00
No. 1.	Iron Bottom, with Enclosed Rod, 20 inches	4.00
No. 2.	Iron Bottom, with Enclosed Rod, 15 inches	3.50

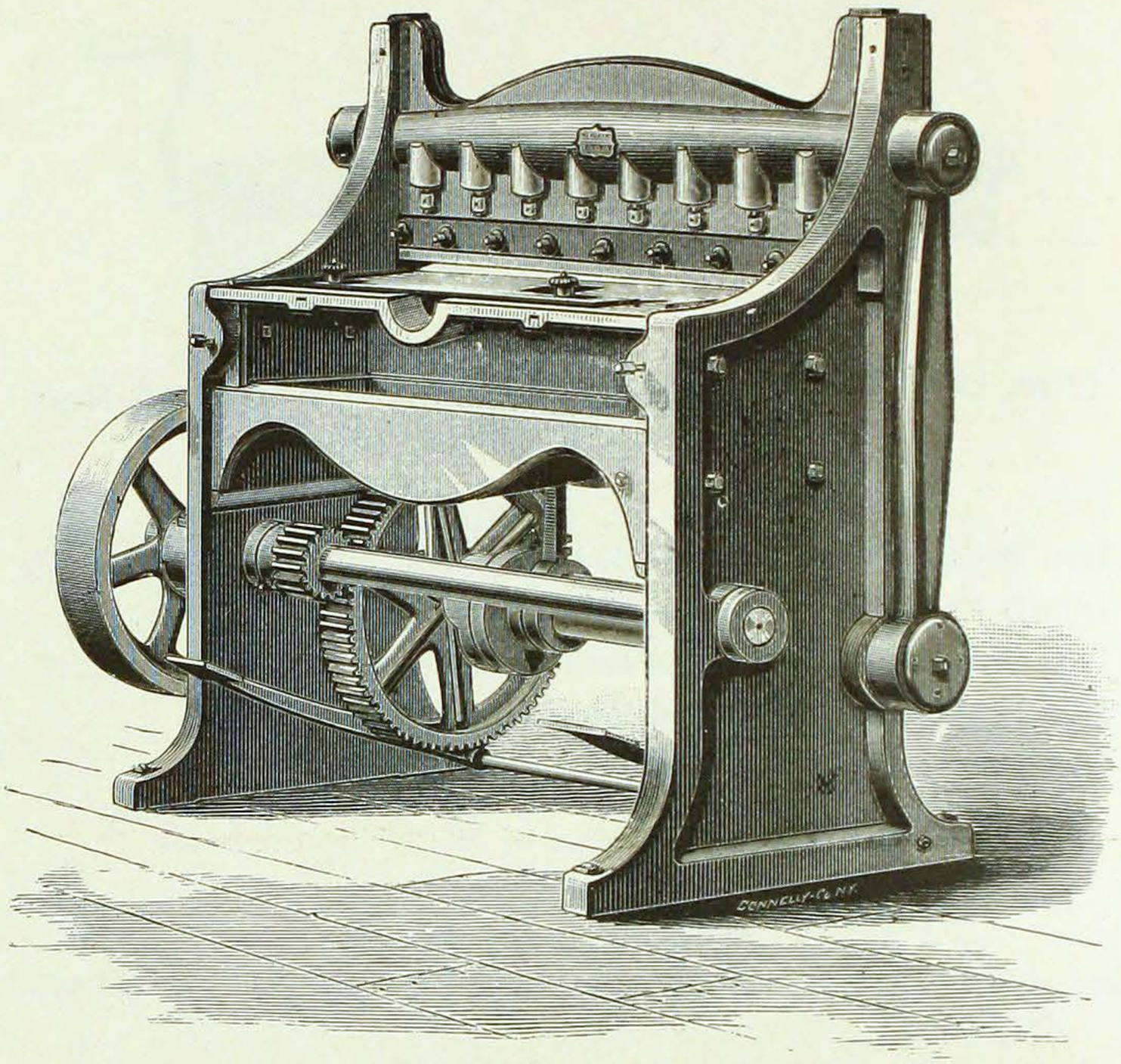
Steel Gutter Rods.



No. A1.	Steel Gutter Rods, $\frac{5}{8}$ to 1 inch diameter, 60 inches long . . .	$8.00
No. 01.	Steel Gutter Rods, $\frac{1}{2}$ to $\frac{7}{8}$ inch diameter, 42 inches long . . .	4.50
No. 02.	Steel Gutter Rods, $\frac{1}{2}$ to $\frac{3}{4}$ inch diameter, 30 inches long . . .	3.00
No. 1.	Steel Gutter Rods, $\frac{3}{8}$ to $\frac{5}{8}$ inch diameter, 20 inches long . . .	2.00
No. 2.	Steel Gutter Rods, $\frac{3}{8}$ to $\frac{5}{8}$ inch diameter, 15 inches long . . .	1.75

Steel Gutter Rods of other diameters and lengths made to order.

SQUARING SHEARS.



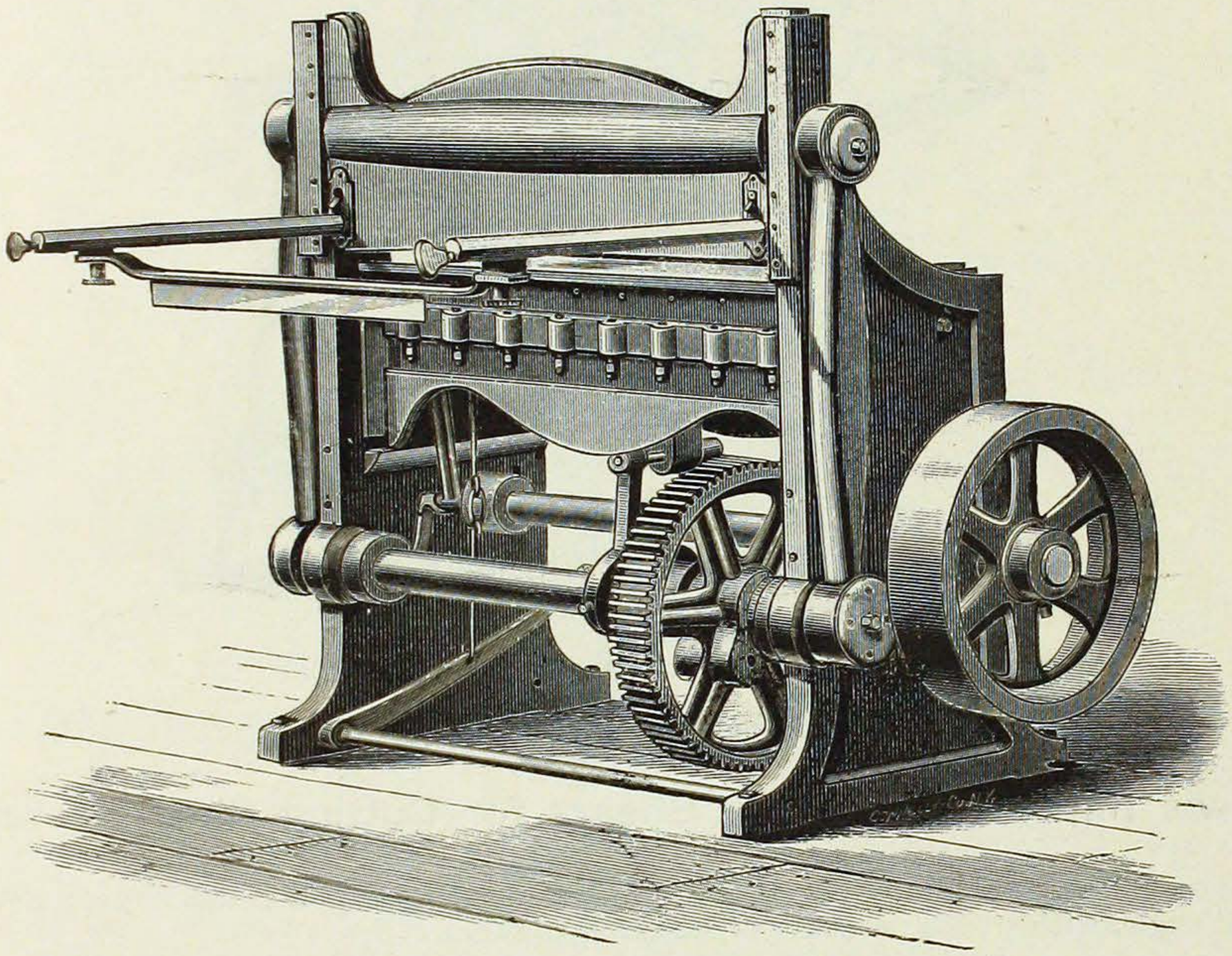
Front View of Shear.

Stow's Power Squaring Shears.

No. 31XX.	Weighs 2700 lbs., will cut $\frac{3}{16}$ Iron, 31 inches in length . . .	$500.00
No. 40XX.	Weighs 2200 lbs., will cut No. 12 Iron, 40½ inches in length . .	400.00
No. 50XX.	Weighs 2700 lbs., will cut No. 16 Iron, 50 inches in length . .	525.00
No. 72XX.	Weighs 3000 lbs., will cut No. 17 Iron, 72 inches in length . .	625.00

For further description see page 61.

SQUARING SHEARS.

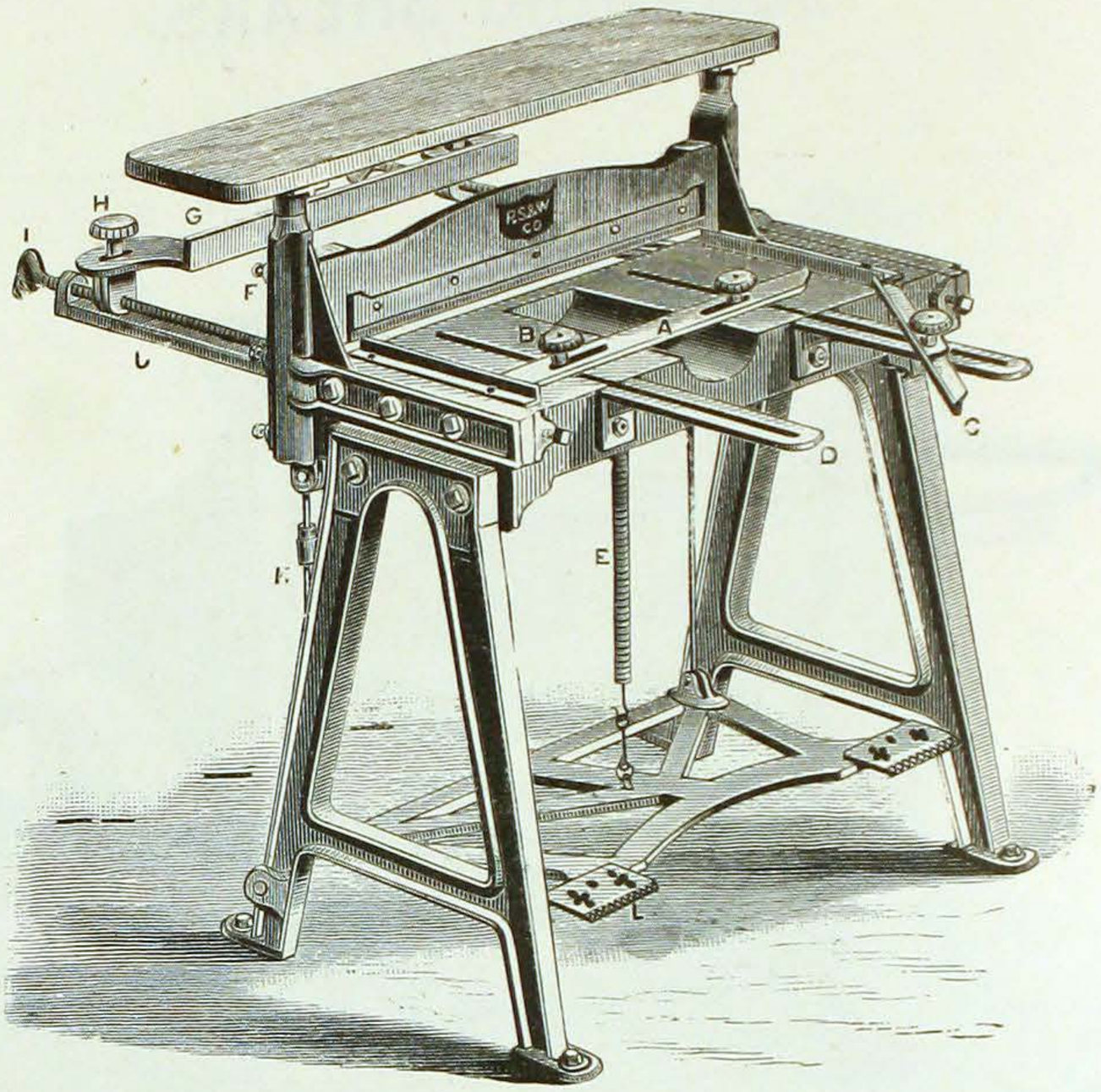


Back view of Shear.

Stow's Power Squaring Shears.

We have recently made several new Power Shears adapted to cutting or shearing heavy metal, and are prepared to furnish the sizes named on page 60. They are made in the most thorough manner, of the best material, and are warranted to cut as heavy metal and to do the work as represented. The above cut represents the back of the same Shear as described on page 60. These Shears are arranged with gauges for squaring and cutting at angles, sheet iron, etc. When required to be boxed for shipping, an extra charge will be made for such work.

SQUARING SHEARS.



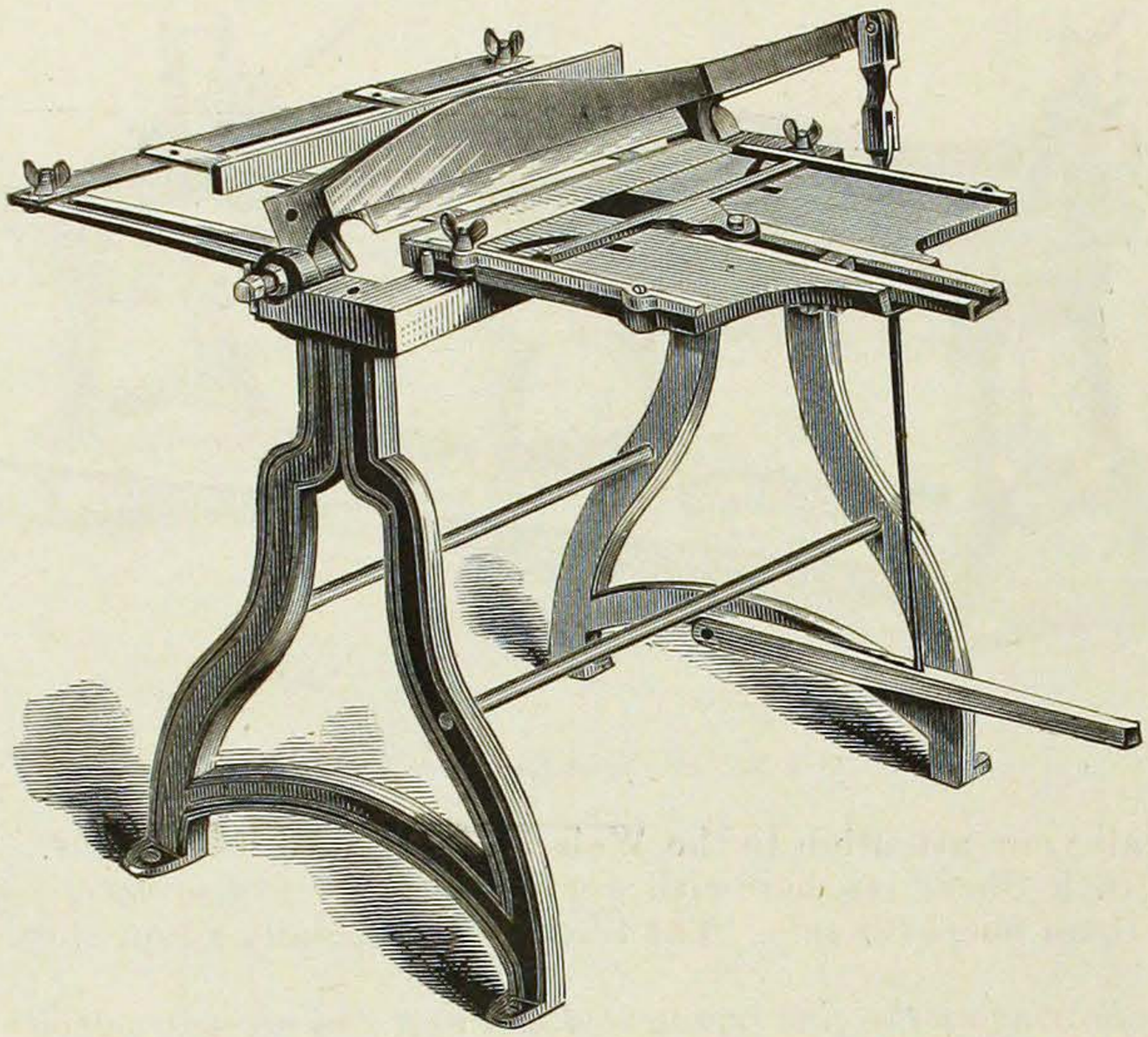
Stow's Improved Squaring Shears for Cutting Sheet Metals.

These Shears are arranged with gauges for squaring, stripping, and cutting at any desired angle, without the necessity of marking the sheet.

No. 12.	Stow's Pattern, with Frame, will cut 20 iron 12 inches in length . .		$35.00
No. 20.	Stow's Pattern, with Frame, for Tin. Cuts 20 inches		35.00
No. 25.	Stow's Pattern, with Frame, for Tin. Cuts 25 inches		45.00
No. 30.	Stow's Pattern, with Frame, for Sheet-Iron. Cuts 30 inches . .		50.00
No. 40.	Stow's Pattern, with Frame, for Sheet-Iron. Cuts 40 inches . .		150.00
No. 50.	Stow's Pattern, with Frame, for Sheet-Iron. Cuts 50 inches . .		200.00
No. 60.	Stow's Pattern, with Frame, for Sheet-Iron. Cuts 60 inches . .		240.00
No. 72.	Stow's Pattern, with Frame, for Sheet-Iron. Cuts 72 inches . .		275.00
Extra Blades for No. 12		per pair	9.00
Extra Blades for No. 20		per pair	9.00
Extra Blades for No. 25		per pair	10.50
Extra Blades for No. 30		per pair	12.00
Extra Blades for No. 40		per pair	22.00
Extra Blades for No. 50		per pair	30.00
Extra Blades for No. 60		per pair	34.00
Treadles for Nos. 20, 25, and 30		each	3.00
Connecting Rods for Nos. 20, 25, and 30		each	1.00
Set of extra Legs for Nos. 20, 25, and 30		per pair	3.00
Extra set of Back Arms, patented for Nos. 12, 20, 25, or 30 . .		per set	5.00

For prices of other parts of Squaring Shears, see Machine Parts.

SQUARING SHEARS.



Wilcox's Squaring Shears for Cutting Sheet Metals.

No. 000 is for Power only. Will Cut No. 12 Iron.

Nos. 00 and 0 are for cutting Heavy Metal, Steel, Iron, Brass, or Copper. They will cut No. 16 Iron.

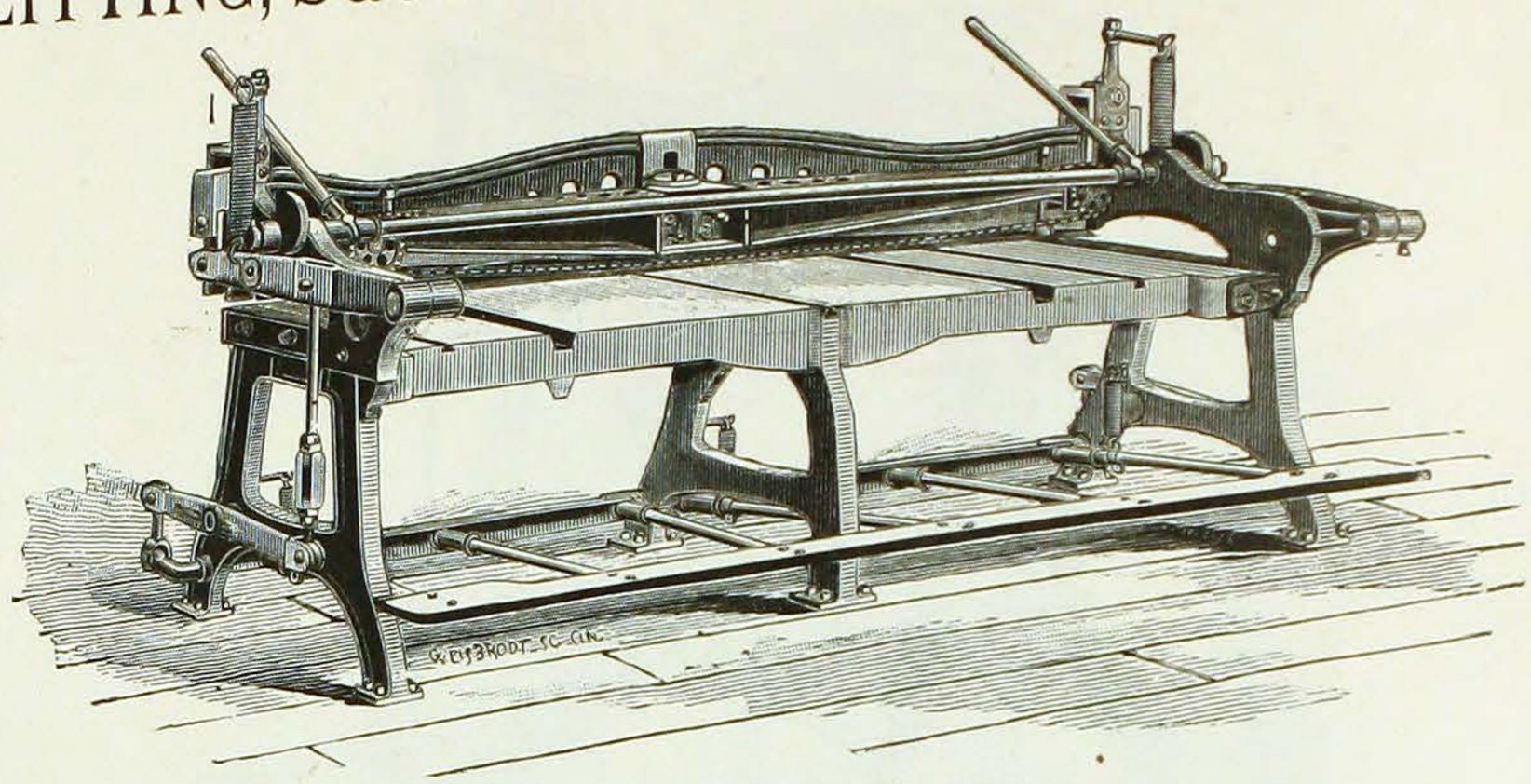
No. 1 is for Sheet-Iron or Tin. No. 2 is for Tin only.

No. 000.	Wilcox's Pattern, with Iron Frame. Cuts 72 inches		$800.00
No. 00.	Wilcox's Pattern, with Iron Frame. Cuts 37 inches		140.00
No. 0.	Wilcox's Pattern, with Iron Frame. Cuts 30 inches		125.00
No. 1.	Wilcox's Pattern, with Iron Frame. Cuts 30 inches		55.00
No. 1.	Wilcox's Pattern, without Iron Frame. Cuts 30 inches . . .		45.00
No. 2.	Wilcox's Pattern, with Iron Frame. Cuts 20 inches		38.00
No. 2.	Wilcox's Pattern, without Iron Frame. Cuts 20 inches . . .		32.00
Extra Blades for No. 00		per pair	20.00
Extra Blades for No. 0		per pair	16.00
Extra Blades for No. 1		per pair	14.00
Extra Blades for No. 2		per pair	9.00

Lever Shears of any desired length, for cutting straight work, made to order.

THE WAIS PATENT COMBINED

SLITTING, SQUARING, AND TRIMMING SHEARS.



No. 2. 8½ foot Cornice Shear.

We here call your attention to the Wais Patent 8 ft. 6 inch Shear. The illustration of the 8 ft. 6 inch Shear, as herewith represented, for *foot* or *lever power, or combined.* We also make them for *power only.* The Shears are specially adapted for cornice makers, roofers, etc.

The Centre-bearing on the gate represented is a new and necessary device for shears from 5 ft. to 10 ft., and will be readily accepted as the only scheme that can be used to do *accurate work* in cutting sheets of lengths named, as all shears to cut these lengths are liable to spring in the middle, as the outside is concave and the inside is convex, from the springing of the gate. With our *Centre-bearing* this is *all overcome* and we *guarantee* that all shears with this bearing will cut *accurately* and *heavier metal* than any other similar shears.

The Side Arms and Links are so connected to the gate, that, as the blade descends, the radial motion of the arms brings the *blades still closer together*, instead of being forced apart as in the ordinary shears, and by thus adapting the arm, as shown, sheets can be fed *latterly*, for slitting long sheets lengthwise, or for cutting a required distance in the sheet. Consequently, *our 5 ft. Shear will slit a 10 ft. sheet lenghtwise, in two cuts.* We construct these Shears of any size, up to 10½ ft. long, to be used either by foot or lever, or combined or with lever and steam power.

The *Adjustable Clamp* or *Hold-down*, attached, can be operated from either end of the Shear, or the centre, and it also clamps the metal in the centre as well as at the end, so as to prevent the sheet from drawing. All of our Shear blades are in one length and, not in sections, and are machine-ground and fitted in without tin or paper lining; consequently are more readily adjusted.

The *Patent Bed adjustment* is composed of an extra bolt inserted in the bed opposite the adjusting bed set screw, therefore the bed is properly adjusted with ease, either forward or backward as the occasion may require, and the bed is also firmer in its place, as the bolt and set-screw are thus secured firm in their place.

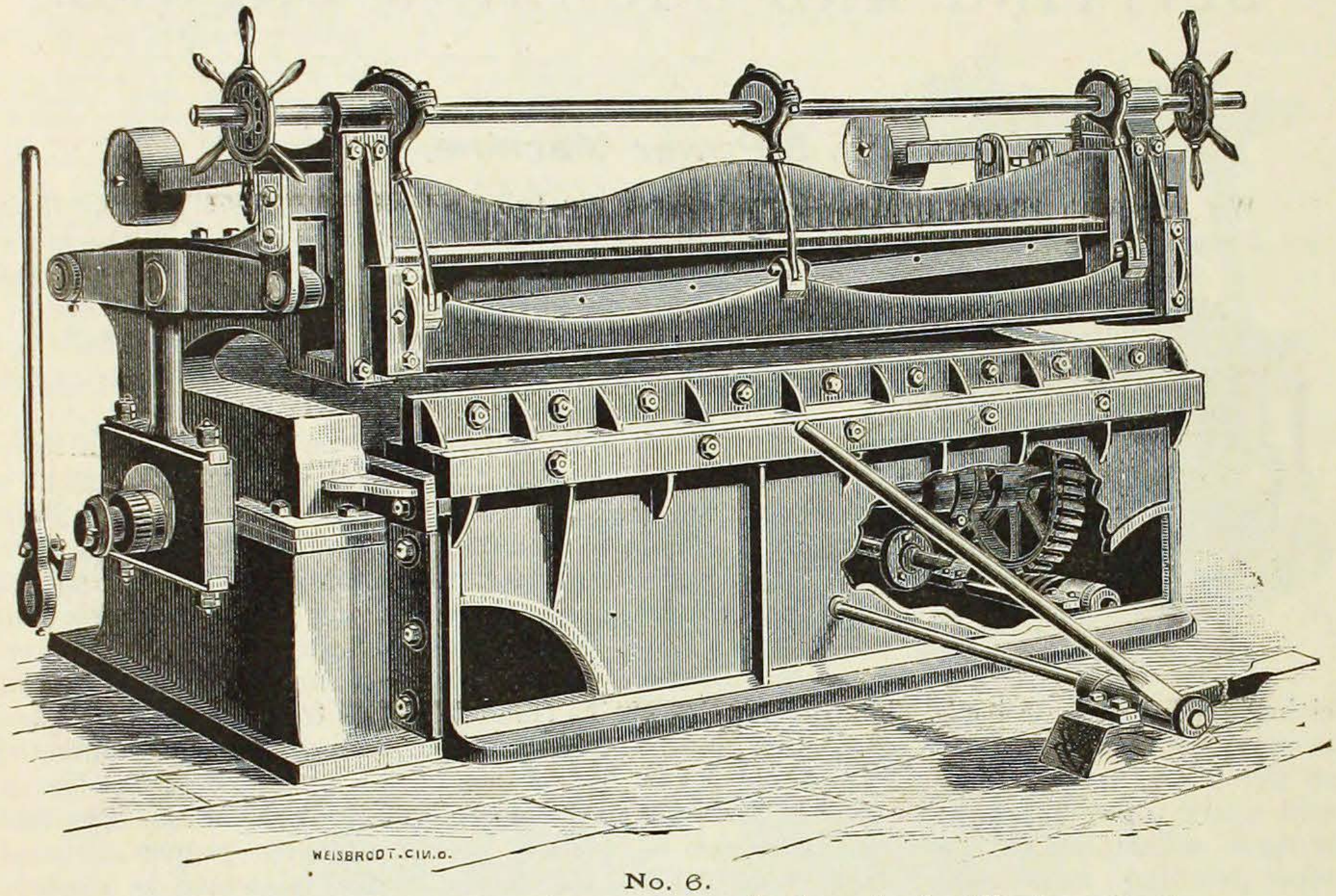
These Shears have been tried and tested by some of the most prominent Cornice-makers, and have been pronounced *the best tool of the kind ever used*, for which we can give references.

Weight of 8 ft. 6 in. Shears, about 1,900 lbs.

Foot Power Shear	$380.00	Foot and Lever Shear, as shown in cut	395.00
Lever Hand Shear	380.00	Steam Power and Lever, combined,	475.00

THE WAIS PATENT COMBINED

SLITTING, SQUARING, AND TRIMMING SHEARS.



No. 6.

The Machines herewith illustrated are far superior to all others, for the following reasons:

(1.) That a sheet of any width or length can be trimmed or cut lengthwise as desired.

(2.) That a 24 or 36 inch sheet or less can be slit lengthwise of any length, or cut into any desired strips up to 12 or 18 inches wide, owing to style of machine.

(3.) They are so constructed that as the blade descends it will draw still closer together, instead of being forced apart.

(4.) They have the only proper shearing motion, by the use of combination of arms, and the assurance of doing better and heavier work with more ease.

☞ **The only Shears with Combination of Arms.**
☞ **The only Combined Foot and Lever Shears.**
☞ **The only Hand Lever Shears.**
☞ **The only Power Shears with Rollers placed on the Table.**
☞ **The only Power Shears that can be used by Hand Lever.**
☞ **The only Device to hold a sheet firmly while Trimming.**

All machines are built of best material, under the supervision of the inventor. They are neat in design and powerful. They are fully warranted to perform the work assigned to them, as shown in table below, and to give the best of satisfaction.

No. 2, Foot and Lever Power, cuts No. 16 Iron.
No. 3, Lever Power only, cuts No. 14 Iron.
No. 4, Power Shears, cuts No. 10 Iron.
No. 5, Power Shears, cuts No. 6 Iron.
No. 6, Power Shears, cuts No. 4 Iron.

Tinners, Cornice-Makers, Metal-Roofers, Range-Makers, Safe-Makers, Boiler-Makers, Rolllng Mills, and Metal-Workers in general, do not fail to investigate the good mechanical devices in the machine illustrated.

The prices are not at all to be considered for the work they do, compared with others, and the sizes of iron they cut.

PRICE LIST No. 6 SHEARS.

Length.	Weight.	Price.
42 inches	4500 pounds	$560.00
50 inches	5000 pounds	620.00
65 inches	6000 pounds	700.00

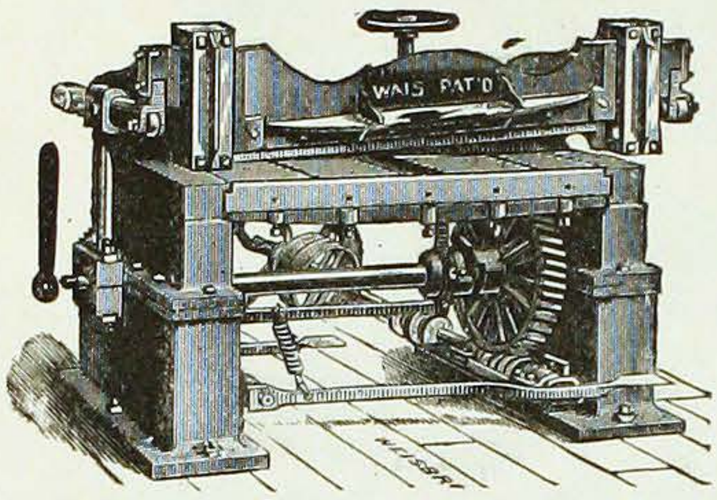
Special sizes furnished to order. Can be made 10½ feet long.

THE WAIS PATENT POWER COMBINED

SLITTING AND SQUARING SHEARS.

No. 5 Power Machine.

We herewith illustrate a new device for cutting and slitting sheet metal. This No. 5 machine combines many valuable features that will be appreciated by all the metal workers. They are built of several sizes, to meet the requirements of the trade, and where they are required to trim very large sheets an extra device is furnished that enables the largest sheets to be trimmed with perfect accuracy.



No. 5, Power Machine.

The Power Shears have an extra lever attachment for adjusting the blades or cutting through a required distance of the sheet. The Shear is built in a substantial manner, and every point in regard to its equalization and permanency is well protected and provided for. The Gearing is of the worm and screw form, which gives a steady, quiet, and powerful motion. The Clutch is arranged to be adjusted either from front or back. The Eccentrics are so constructed as to be readily adjusted to compensate for loss of wear in the blades. The Arms and Links are so connected to the gate, that as the blade descends the radial motion of the Arm brings the blades still closer together instead of being forced apart as in the ordinary shears. The Bed is made adjustable, so that the blades can be quickly placed at their proper distance after grinding; it is also provided with rollers, the upper surface of which is slightly above the top of the bed; this feature enables the sheets to be easily moved, and at the same time take the destructive wear off the edge of the lower blade.

The Machine is provided with all necessary auxiliaries, such as platen to clamp the sheet, gauges, etc. The weight of the Machine is 2,600 lbs., and it will perform the duty of cutting 24 feet per minute of any desired thickness up to No. 6, or $\frac{3}{16}$ inch iron. A strip may be cut from a sheet up to 12 inches wide of any length. A sheet can be squared up to 36 inches.

No. 4 Power Machine.

Same in design and construction, with the exception of being lighter. Will cut No. 8 iron same width as No. 5.

Can furnish either of above Shears to cut 8 feet in length.

Price No. 4 Power Machine.

37 inches	$410.00
42 inches	475.00
48 inches	540.00

Price No. 5 Power Machine.

37 inches	$475.00
42 inches	540.00
50 inches	615.00

☞ Special sizes of all styles made to order.

WAIS' PATENT COMBINED FOOT AND LEVER SHEAR.

(HEREWITH ILLUSTRATED.)

No. 2. This Shear has many superior advantages over other Shears.

(1.) It can be used as an ordinary square shear.

(2.) It has the great advantage over all other shears that it will cut strips of any length and width up to 12 inches.

(3.) The lever motion is independent of the treadle motion. Can be used where there is heavier metal to be cut, up to No. 16 iron or 14 copper; can also be used to cut a number of lighter pieces at one time. The motion can be regulated in cutting a required distance through a sheet. The lever and open throat is a great advantage for many purposes, making the shear two tools in one (slitting and squaring.

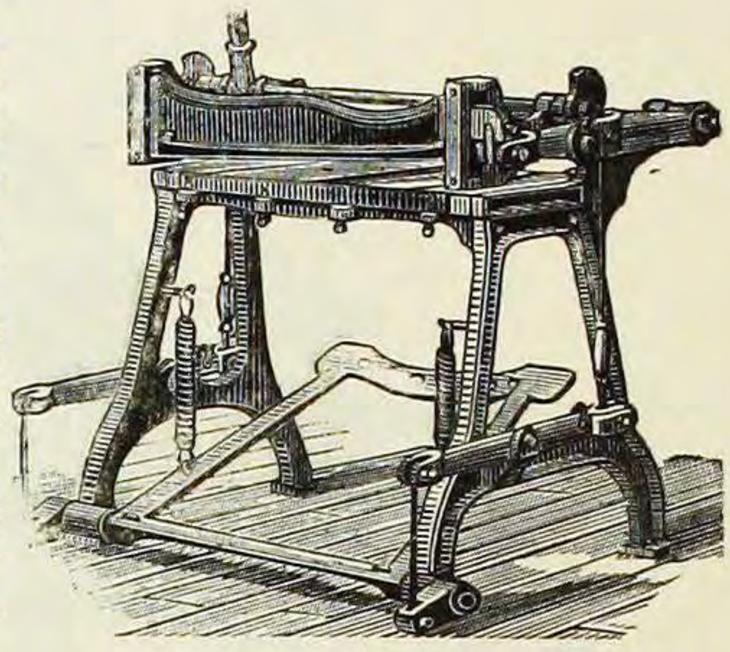
(4.) The arms and links are so constructed to the gate that the radial motion of the arms brings the blades and gate closer together, and therefore it will cut more accurately and easier than the ordinary make of shear.

(5.) The treadle has wrought-iron bearings, with crank on the outside of the leg, so that it holds the legs firmly together, so they cannot spread apart by moving and break.

(6.) The blades are machine ground and do not require any skilled mechanic to adjust them or replace them, while there is no packing or lining under them.

(7.) The bed is so constructed as to slide between the legs and side-bearings, and can be adjusted by two set screws set back or forward, and no hammer being required. All the joints on the shear are reamed out and strong bolts fitted, so that there is no lost motion.

(8.) We also furnish a clamp or hold down to accompany thls shear, if desired.

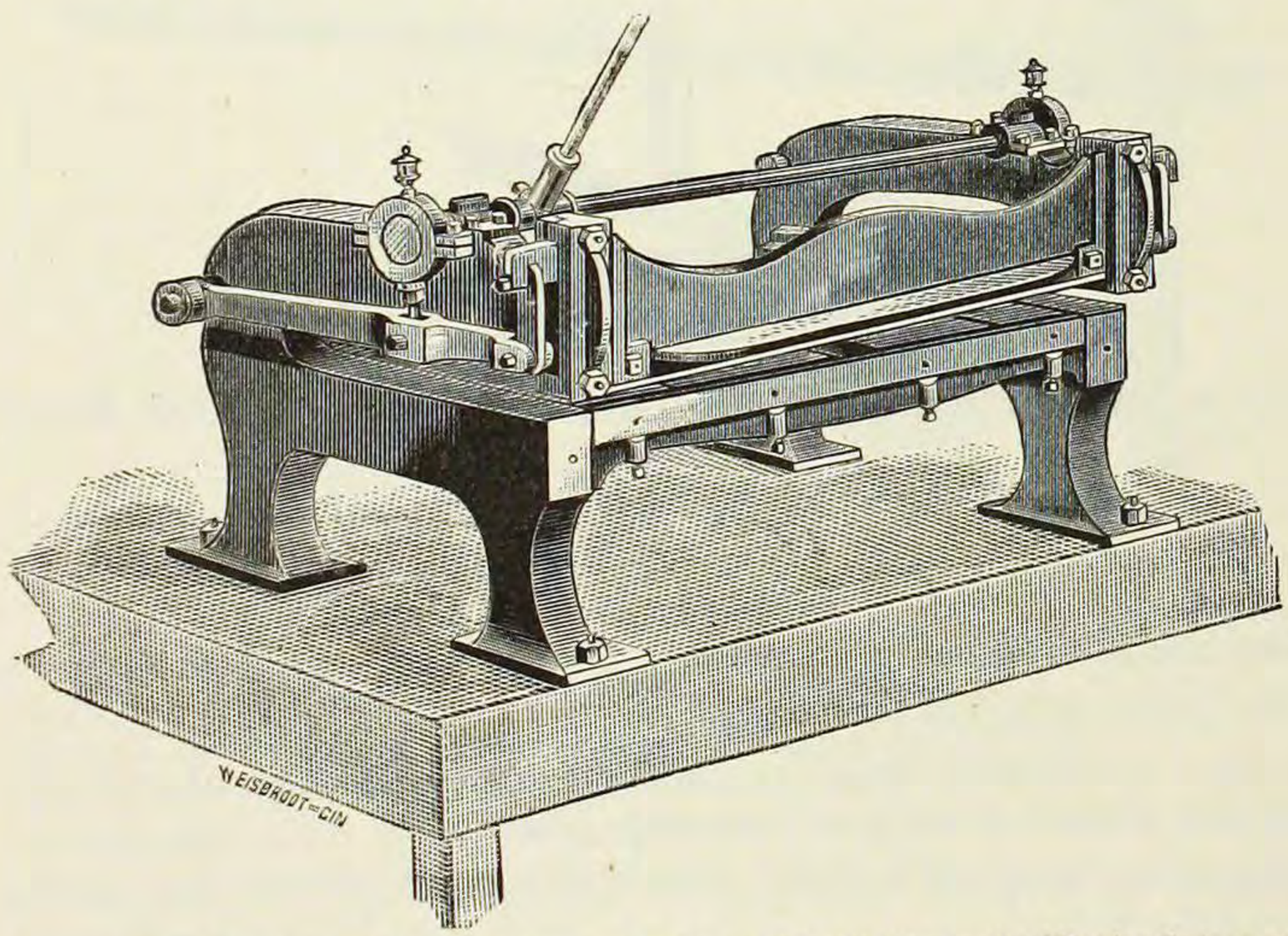


Price No. 2 Shears.

31 inches	$80.00	50 inches	$170.00
42 inches	125.00	62 inches	220.00

WAIS' PATENT SLITTING, SQUARING & TRIMMING SHEARS.

ALL SIZES REQUIRED.



In offering the new No. 3 Slitting and Squaring Shear, we call especial attention to the following facts or points for which it is designed:

This shear will cut No. 16 iron with ease up to 4 feet wide, and is sufficiently strong to cut still heavier metal if desired, by the use of one or more levers, or a longer lever, which can be provided for, as seen by cut.

For slitting quick and accurate, it has no equal. By one motion it will cut the full length of the blade, if desired; consequently a four-foot shear will slit a sheet 8 feet long lengthwise in two cuts—after making one cut the sheet to be moved up. The adjustable gauge on the bed can be used to insure accurate work, and in like manner for cutting any desired strip from 1 inch to 18 inches wide, from a sheet of any length, with either size shear of this pattern. Also, an extra wide sheet can be cut and slitted as desired to much better advantages in various ways not mentioned. In cutting cone shape of any length, or a corner, can be cut from a long sheet, etc., with the lever motion, the cut can be better regulated in cutting a required distance through a sheet.

We would call especial attention to the drop-leaf table, which we furnish if desired for this No. 3 Shear.

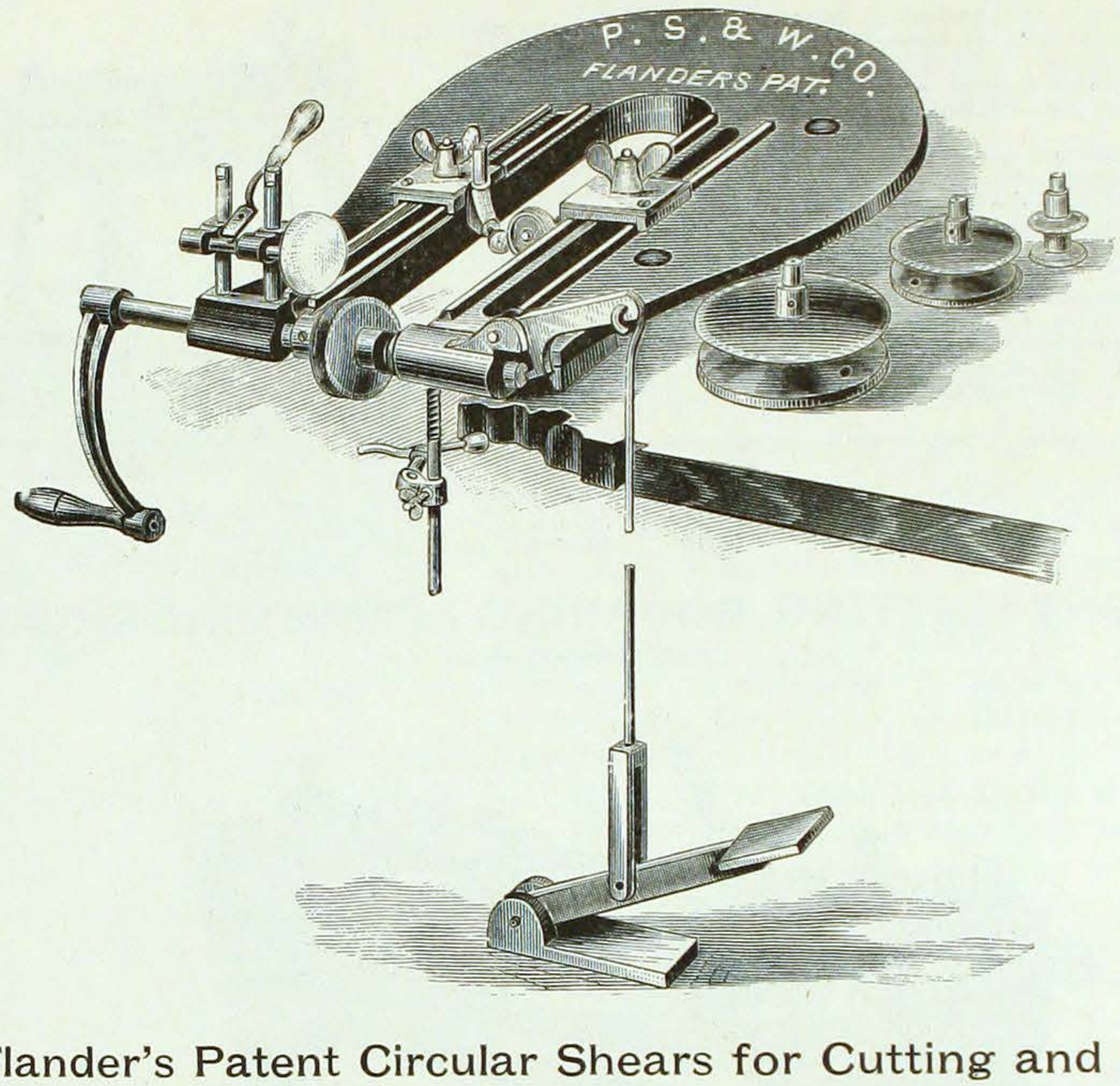
We consider this tool indispensable where much slitting or squaring are required, and especially for cutting heavy metal of any kind, say the least slitting, of which is much of importance.

Weight of No. 3, 32-inch Shears. 640 lbs. . $85.00 | Frame Bench . $6.00 | Frame Bench and Drop-Leaf Table . $9.00

Price No. 3 Shears.

42 inch	$125.00	50 inch	$165.00
62 inch	$215.00		

ROTARY SHEARS.



Flander's Patent Circular Shears for Cutting and Bending.

WITH FOUR PAIR OF DISCS.

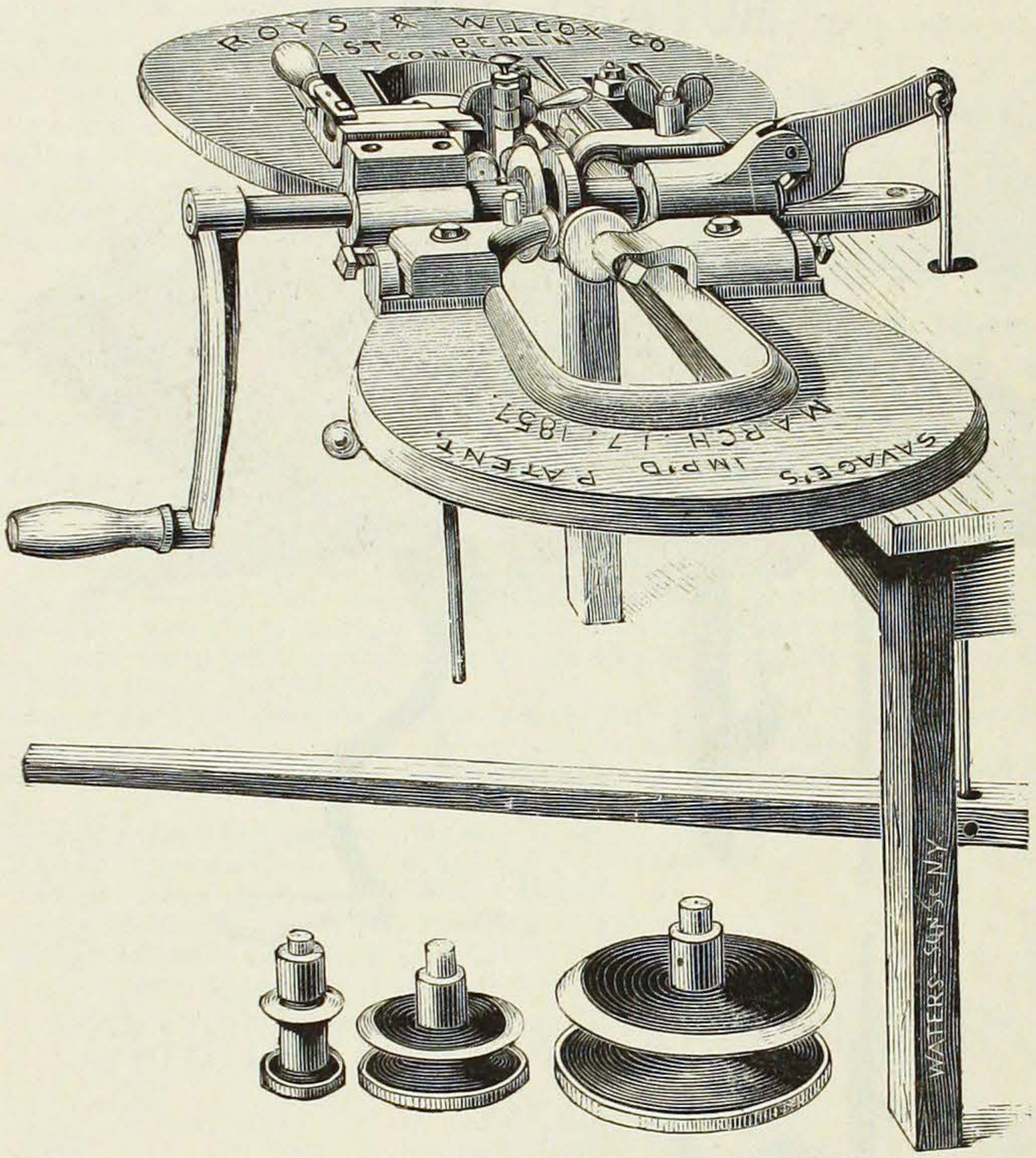
One pair each of 1⅞, 3, 4⅞, and 7⅝ inches in diameter.

No. 0 will cut circles 30 inches in diameter.

No. 1 will cut circles 23 inches in diameter.

No. 0.	Operated by steam or hand power, for gas-meters, etc., with one pair 10¼ inch Discs and one pair Cutters on iron frame		$150.00
No. 1.	Operated by hand, for tin, etc., with four pair Discs, one pair Cutters and Edge Turner		30.00
No. 1.	Without Edge Turner		25.00
Extra Discs for No. 0, not over 15 inches in diameter		per pair	9.00
Extra Discs for No. 1, not over 8 inches in diameter		per pair	1.50
Extra Cutters for No. 0		per pair	3.50
Extra Cutters for No. 1		per pair	1.50
Extra Cutter Stocks, for No. 1		per pair	2.50
Low's Patent Shears, for cutting parallel curves for pan sections			80.00
Low's Beveling Shears, for cutting ends of pan sections			45.00

ROTARY SHEARS.



Savage's Patent Combination Circular Shears.

No. 1 with four pair Discs. One pair each of 1⅞, 3, 4⅞, and 7⅝ inches In diameter.

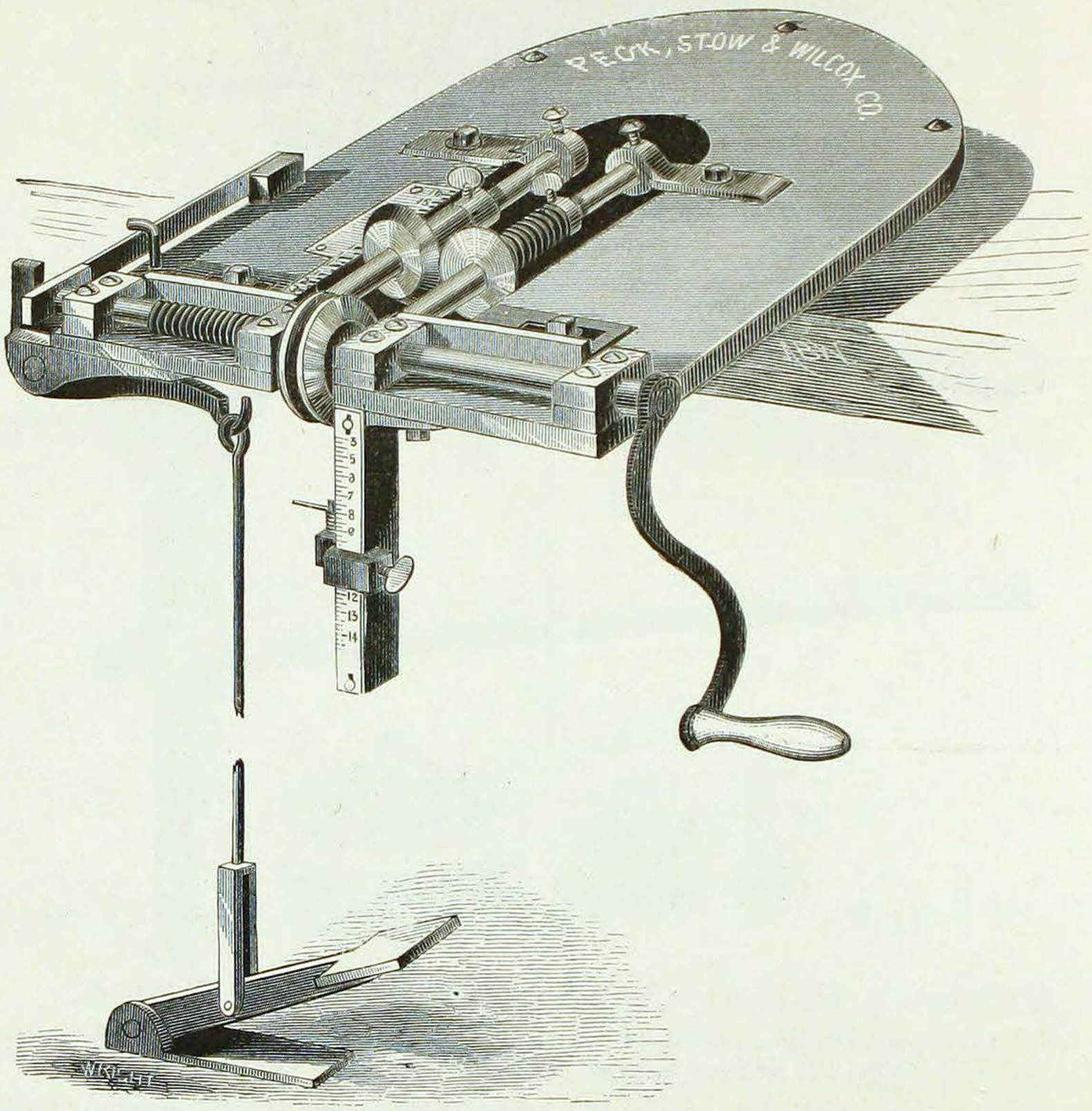
OTHER SIZES WITH ONE PAIR DISCS ONLY.

These Shears will cut circles, and bend or burr the same at any desired angle without extra discs.

No. 000 will cut circles 48 inches in diameter from No. 14 iron.
No. 00 will cut circles 34 inches in diameter from No. 16 iron.
No. 0 will cut circles 24 inches in diameter from No. 20 Iron.
No. 1 will cut circles 23 inches in diameter from Tin.

No. 000.	For Power only		$400.00
No. 00.	For Heavy Metal, with one pair Discs, not over 12 inches		250.00
No. 0.	For Heavy Metal, with one pair Discs, not over 12 inches		150.00
No. 1.	For Light Metal, with Burring Attachment		35.00
No. 1.	For Light Metal, without Burring Attachment		30.00
No. 1.	With both Burring Attachment and Edge Turner		40.00
Extra Discs for Nos. 00 and 0, not over 15 inches in diameter		per pair	9.00
Extra Discs for No. 1, not over 8 inches in diameter		per pair	1.50
Extra Cutters for Nos. 00 and 0		per pair	3.50
Extra Cutters for No. 1		per pair	1.50
Extra Cutter Stocks for No. 1		per pair	2.50
Extra Edge Turner for No. 1			5.00

ROTARY SHEARS.



Newton's Patent Circular Shears.

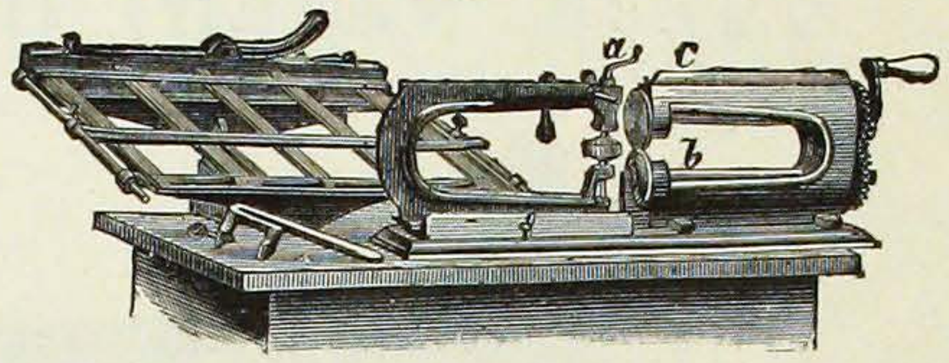
WITH TWO PAIR DISCS, ONE PAIR EACH OF 2⅜ AND 5⅞ INCHES IN DIAMETER.

Will cut circles from 3 to 14 inches in diameter from Tin.

Newton's Circular Shears		$22.00
Extra Discs or Cutters	per pair	1.50
Extra Sliding Gauge		1.50

SHEARS.

In introducing this Machine to the manufacturers of tinware, we can safely assure all that it is the cheapest, most simple, practicable, and reliable machine for cutting tin ever invented.



Waugh's Bevel, Square, and Circular Shears.

It will cut any square or bevel, from twenty inches downwards, and may be changed from that to circular cutting in a moment. It will cut any circle desired, or any bevel, or straight work used in a tin-shop; and it is the only machine by which a single circle can be cut advantageously. A great advantage is gained in the use of this machine over any other yet introduced, as no time is lost in setting the cutters, they being always set and ready for use.

The cutters are set at such an angle to each other as to keep themselves sharp by their own friction, and this is the only true principle upon which a Circular Shear should be constructed; that is to say, having the circle disc that holds the tin adjustable and the cutters stationary; more cutters are worn out by setting them wrong than by the amount of work they perform. All that is necessary to do in order to change this machine from circular to squaring, is to slide out the circle disc, which is held in the groove at the base by a thumb-screw, and place the bevel and squaring carriage in the same groove. This simple combination, a practical tinner will readily see, gives him the benefit of cutting all the tin necessary to be used in a tin-shop upon one machine, whereby much room, labor, and expense are saved.

Each Machine includes a rim-gauge, which can be attached to the lower shear-head (*b*) for cutting any cover-hoop or rim, either bevel or straight by simply describing, first the style of rim desired, turning the crank, and letting the tin feed through.

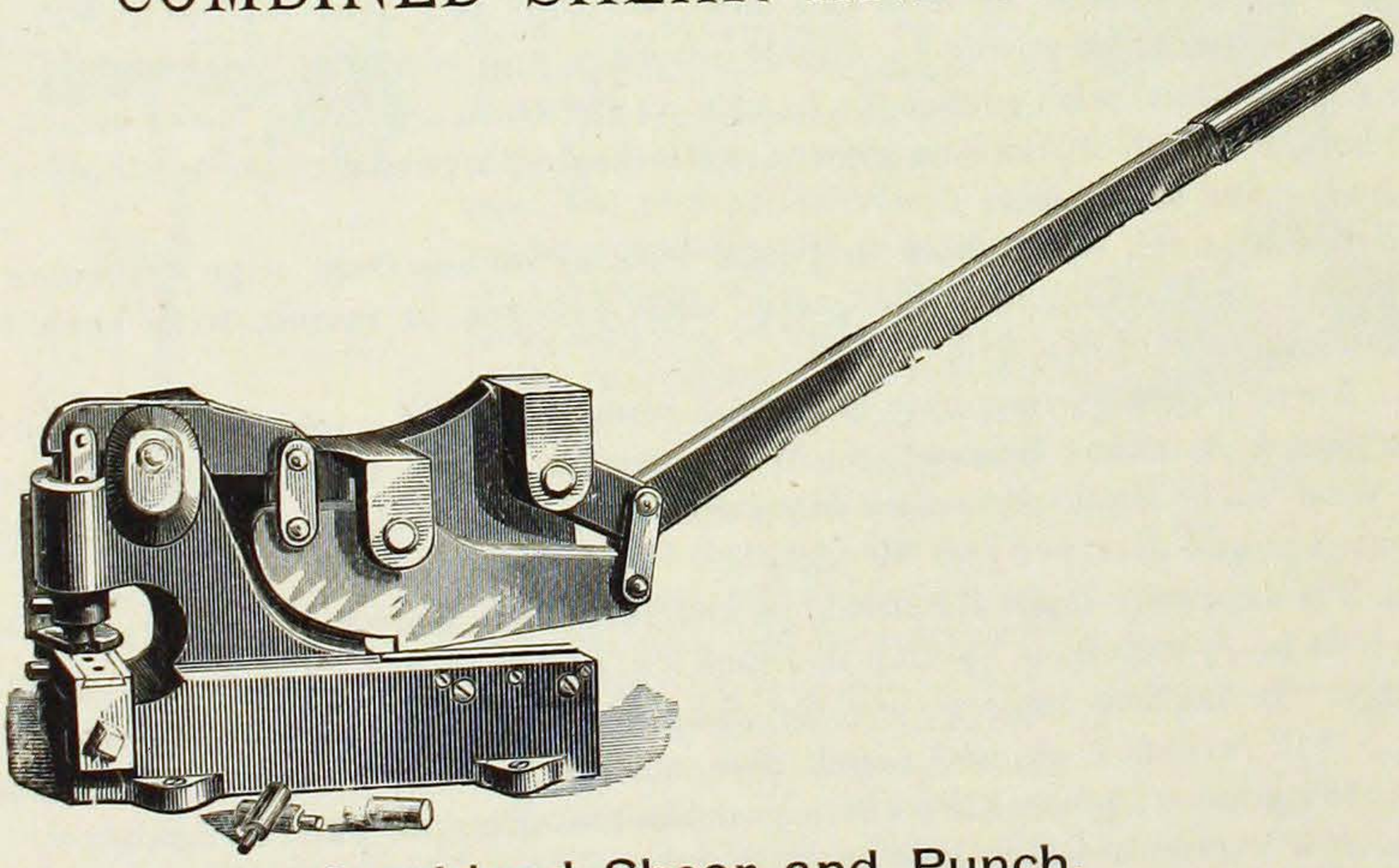
This Machine is designed for cutting light or heavy plate tin, copper, sheet-iron, or brass; 1 x x x x tin may be cut as readily as 1 x tin; two sheets can be cut at a time, if desired.

With each Machine are sent printed directions for use, and all are inspected and tried by the patentee before shipment.

No. 1.	Waugh's Circular Shear, cuts 14 inch Circles	$33.00
No. 1.	Waugh's Circular Shear, with Squaring Attachment	43.00
No. 2.	Waugh's Circular Shear, cuts 20 inch Circles	38.00
No. 2.	Waugh's Circular Shear, with Squaring Attachment	48.00
No. 3.	Waugh's Circular Shear, for Power, cuts 40 inch Circles	75.00

No squaring attachment made for No. 3 Machine.

COMBINED SHEAR AND PUNCH.



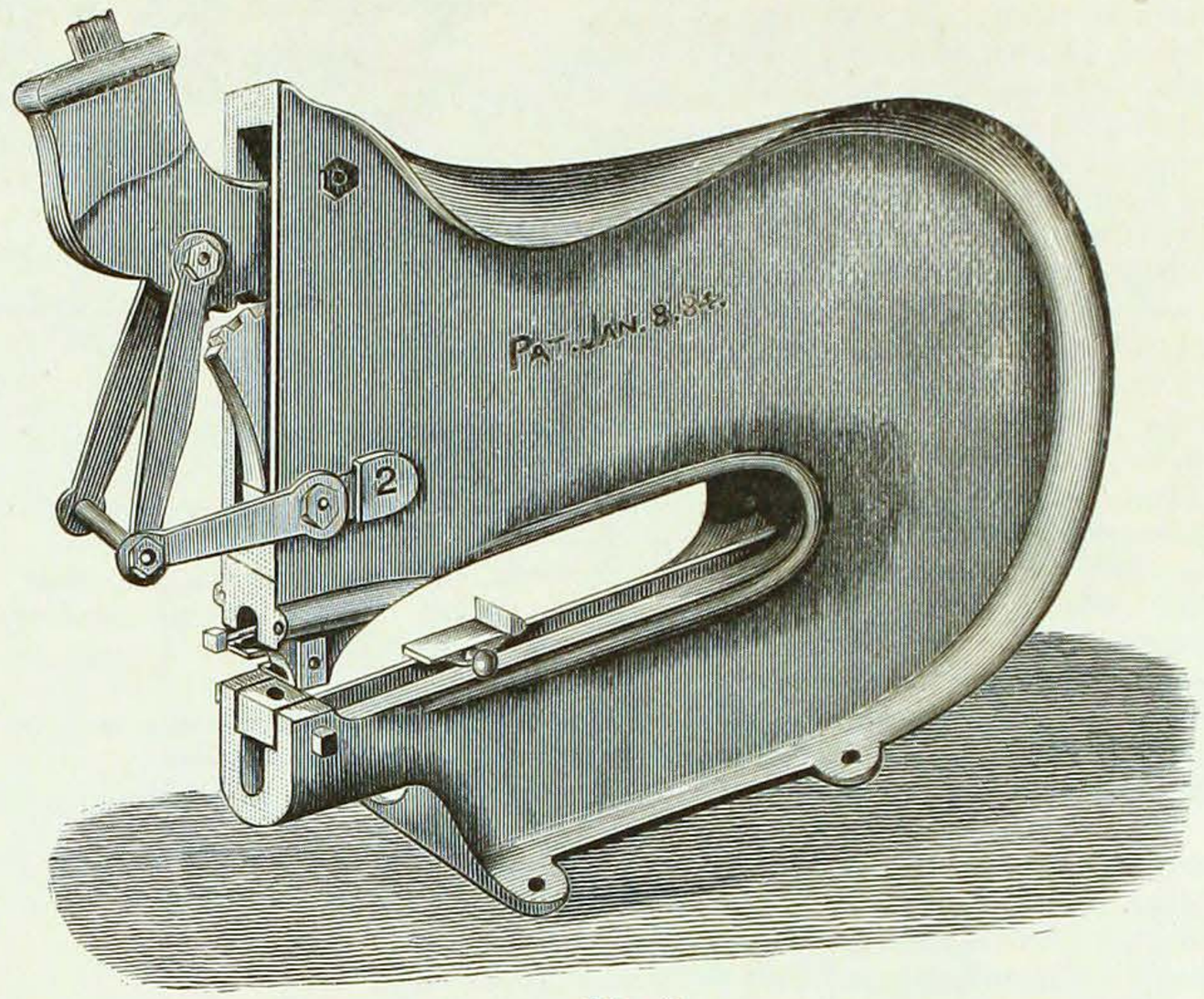
Combined Shear and Punch.

These Machines are suitable for both cutting and punching metal. They may be used on Nos. 14 and 16 iron. Three extra punches of different sizes accompany each Machine.

No. 1.	Combined Shear and Punch	$16.00
No. 2.	Combined Shear and Punch	20.00

THE RICE

PATENT HAND PUNCH.



No. 2.

We would respectfully invite the attention of metal-workers, wagon- and carriage-builders to these Punches, as it is the most powerful and most desirable Punch in the market. It obtains its power by double leverage and eccentric combined. The upper eccentric is provided with socket for handle, as shown in cut. The lower eccentric rocks on tool holder, which works in a groove, with steel pin passing through holder and slot in the frame, and steel lever.

No. 0 will punch $\frac{1}{4}$-inch hole in $\frac{1}{8}$-inch iron, $2\frac{1}{4}$ inches from edge to centre of hole. Will furnish $\frac{1}{8}$, $\frac{3}{16}$, and $\frac{1}{4}$-inch die plate, with punches to match, with each Machine. Weight, 13 pounds; price, $10.

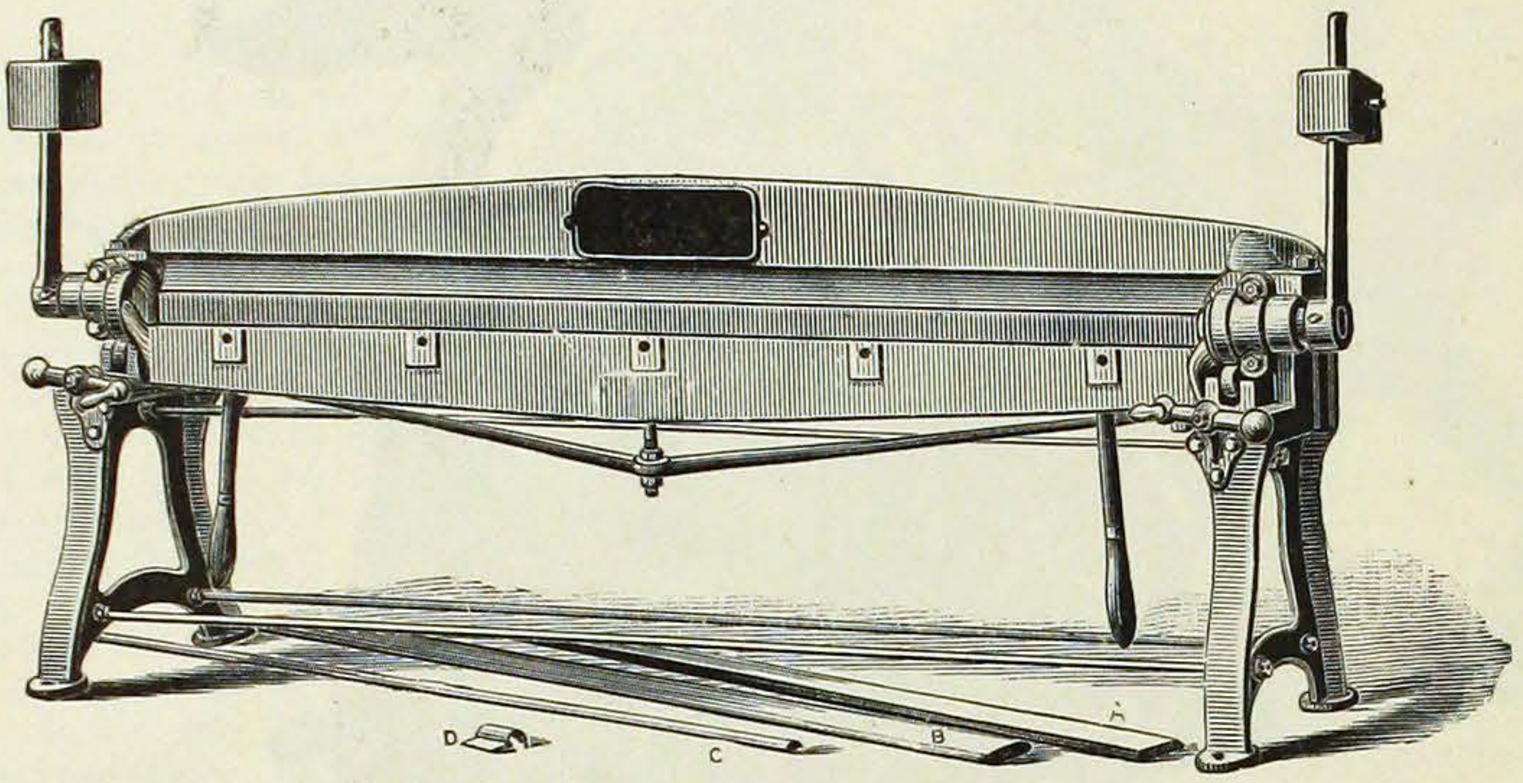
No. 1 will punch $\frac{3}{16}$-inch hole in $\frac{3}{16}$-inch iron, $\frac{5}{16}$-inch in $\frac{1}{8}$-inch iron, or $\frac{1}{2}$-inch in No. 14 wire gauge, 3 inches from edge. Will furnish $\frac{1}{8}$, $\frac{3}{16}$, or $\frac{1}{4}$-inch dies, and punches to match, with each Machine, unless otherwise ordered. Weight, 45 pounds; price, $15; extra punches and dies, per pair 90 cents.

No. 2 is expressly made for tin-shops and sheet-iron workers generally. Will punch $\frac{3}{16}$-inch hole in $\frac{3}{16}$-inch iron, $\frac{5}{16}$-inch in $\frac{1}{8}$-inch, or $\frac{1}{2}$-inch in No. 14 wire gauge, $13\frac{1}{2}$ inches from edge. It has two gauges—one for gauging holes same distance apart (not shown in cut). Will furnish $\frac{1}{8}$, $\frac{3}{16}$, and $\frac{1}{4}$-inch dies, with punches to match, with each Machine. Weight, 140 pounds; price, $25; extra punches and dies, per pair, 90 cents.

No. 3 will punch $\frac{3}{8}$-inch hole in $\frac{5}{16}$-inch iron, $\frac{1}{2}$-inch hole in $\frac{1}{4}$-inch iron, or $1\frac{1}{8}$-inch hole in $\frac{1}{8}$-inch plate, 4 inches from edge. We furnish $\frac{1}{4}$, $\frac{5}{16}$, and $\frac{3}{8}$-inch die plates, with punches to match, with each Machine. Weight, 150 pounds; price, $25; extra die plates. 3 holes each, with punches to match, $4.

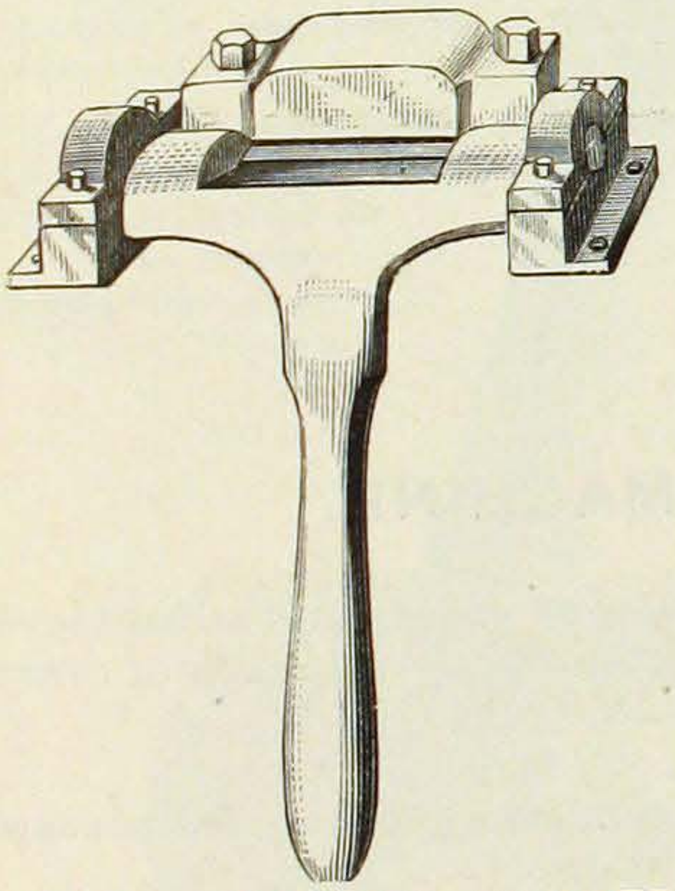
THE CALVIN CARR

IMPROVED AUTOMATIC CORNICE BRAKE.



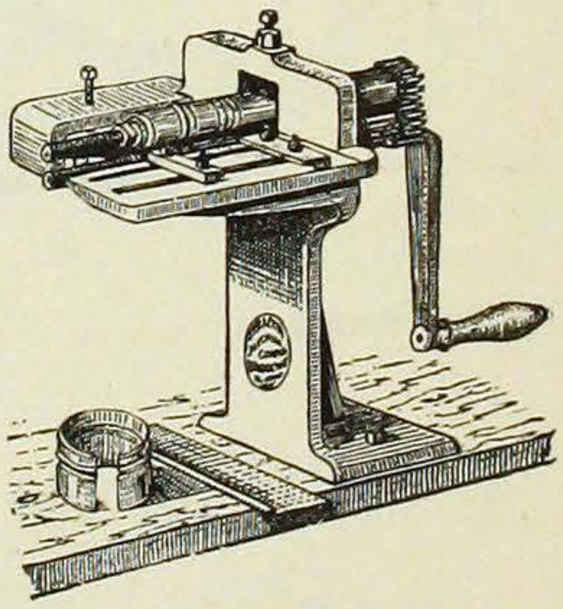
THE AUTOMATIC BRAKE.

It automatically clamps, bends and forms the iron with one motion when self-forming, or it automatically clamps the iron and former when hand-forming. ***This is the only Self-Forming and Hand-Forming Brake Combined in the World.*** From 500 to 1000 feet can be formed a day. This machine is widely used for bending the various parts of Stoves and Furnaces, Refrigerators, Pans of all sizes, and for a large number of shapes in Tinware.

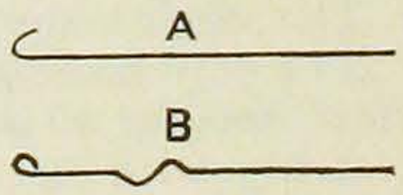


BRACE AND WIRE BENDER.
Price $12.50.

The Tin Cup Machine here shown is for making the bodies of tin cups, dinner pails, and other similar articles, each complete at one revolution. A strip of tin is first cut and edge bent in the folding brake, as at A, and then passed through this machine, which makes a flange at the bottom, an "O G" swedge, and imitation wiring at top, as at B, and bends into cylindrical form as shown in cut, all ready for soldering. Since this was made the machine has been improved, and is now fitted up with longer braced shafts and arranged so that changeable rolls and formers can be used. With these any length and diameter of cups, pails, etc., up to $6\frac{1}{2}$ inches long by 6 inches diameter can be made simply by having one former for each diameter of body required, and the O G swedge can be varied in height as desired. It will produce a very much greater quantity of work than can be made in the old fashioned way. The only objections to its universal use are that the ends of body are left slightly flattened, and that they have to be sprung open to take them off the rolls after they are formed. The weight is ninety pounds. ***Price*** of machine complete, with ***changeable steel rolls*** and formers, etc., for six sizes of bodies to order, ***$60. Price,*** with ***solid*** rolls and former, etc., for one size of cup or pail, ***$45.***

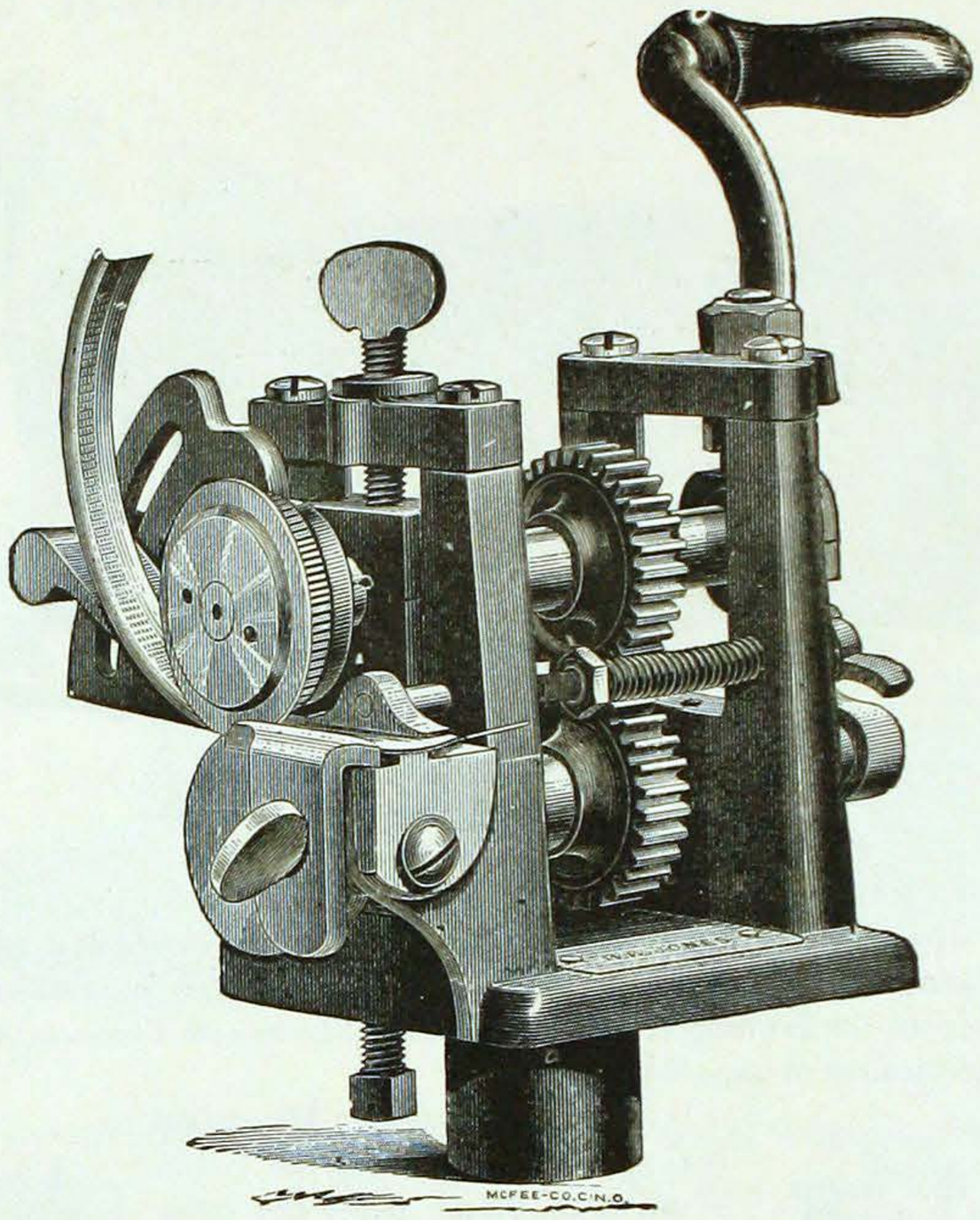


TIN CUP MACHINE.



W. W. JONES'

PATENT RIM MACHINE.



(Patented December 28, 1880. Improved July 12, 1881.)

PRICE.

With Stand $25.00

DESCRIPTION OF

W. W. JONES' PATENT RIM MACHINE.

This Machine is now offered to the trade with all its improvements and advantages. By it the manufacture of plain tinware is made easy, and is within the reach of every one in that business.

The small manufacturer can successfully compete with the large.

The only machine ever made that will *form*, *flare*, and *edge* straight strips of tin into perfect rims for all kinds of sheet metal vessels at one operation.

A boy with one hour's experience can do the work of half a dozen experienced journeymen.

It saves all the scraps of tin from the square shears that are now thrown into the scrap pile.

In nearly all kinds of straight work the rims can be provided for in cutting out, thus saving all the tin that is now cut up for rims.

Live manufacturers, after having tested it for one week, would not be without it for ten times what it cost.

A test of two years has failed to reveal any weak points in its construction.

PRESS 43.

Scale One-Twelfth of Real Size.

This cut represents the general shape and style of a

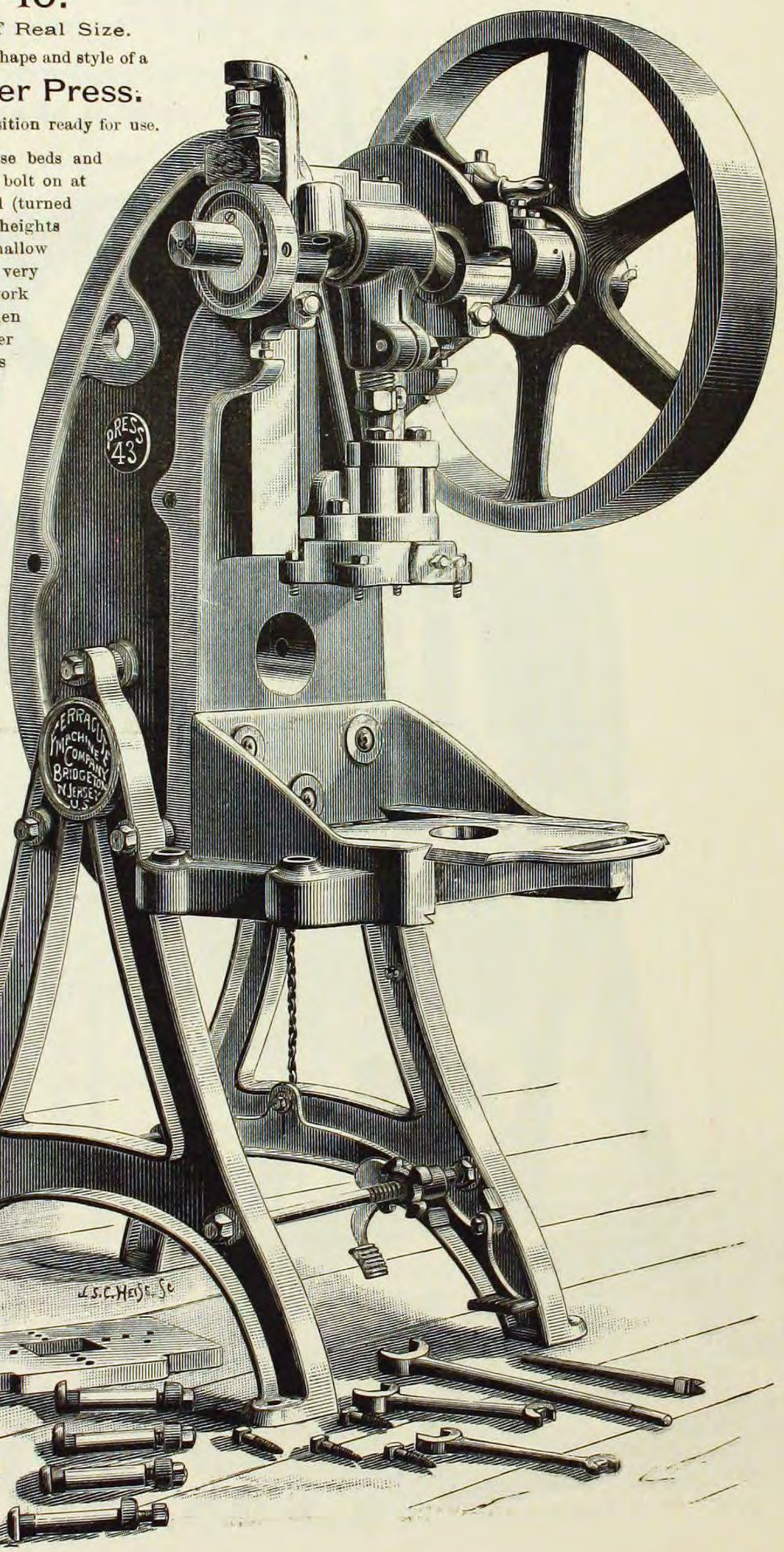
Flat Front Power Press.

With wiring bed set in lower position ready for use.

These Wiring Presses have loose beds and sliding plates as shown. The beds bolt on at different heights or may be reversed (turned upside down), thus giving proper heights from bed up to slide-bar for wiring shallow pans, deep pans, or cups, pails, and very deep cans, etc. The sliding plates work in recesses provided for them, when bed is in either position. The upper wiring die fastens to the slide-bar as usual, and the lower die bolts on to the sliding plate so that it may be drawn out to remove the work after being wired.

Three advantages of these presses over the old kind of wiring presses are: 1st, the open front style, giving room to handle the work quickly; 2d, the reversible bed, saving the expense of building high dies for shallow work; 3d, the fact of their being combination presses, adapting them equally well for wiring, seaming, or "horning," cutting and forming, thus saving an outlay of capital for three separate presses. Flat bolster plates, die clamps, etc., are provided with them to adapt them for ordinary dies.

Price, including etceteras, $290.
Weight, about 1700 lbs.
Greatest diameter that can be wired, 10 inches.
Greatest depth that can be wired, 13 inches.



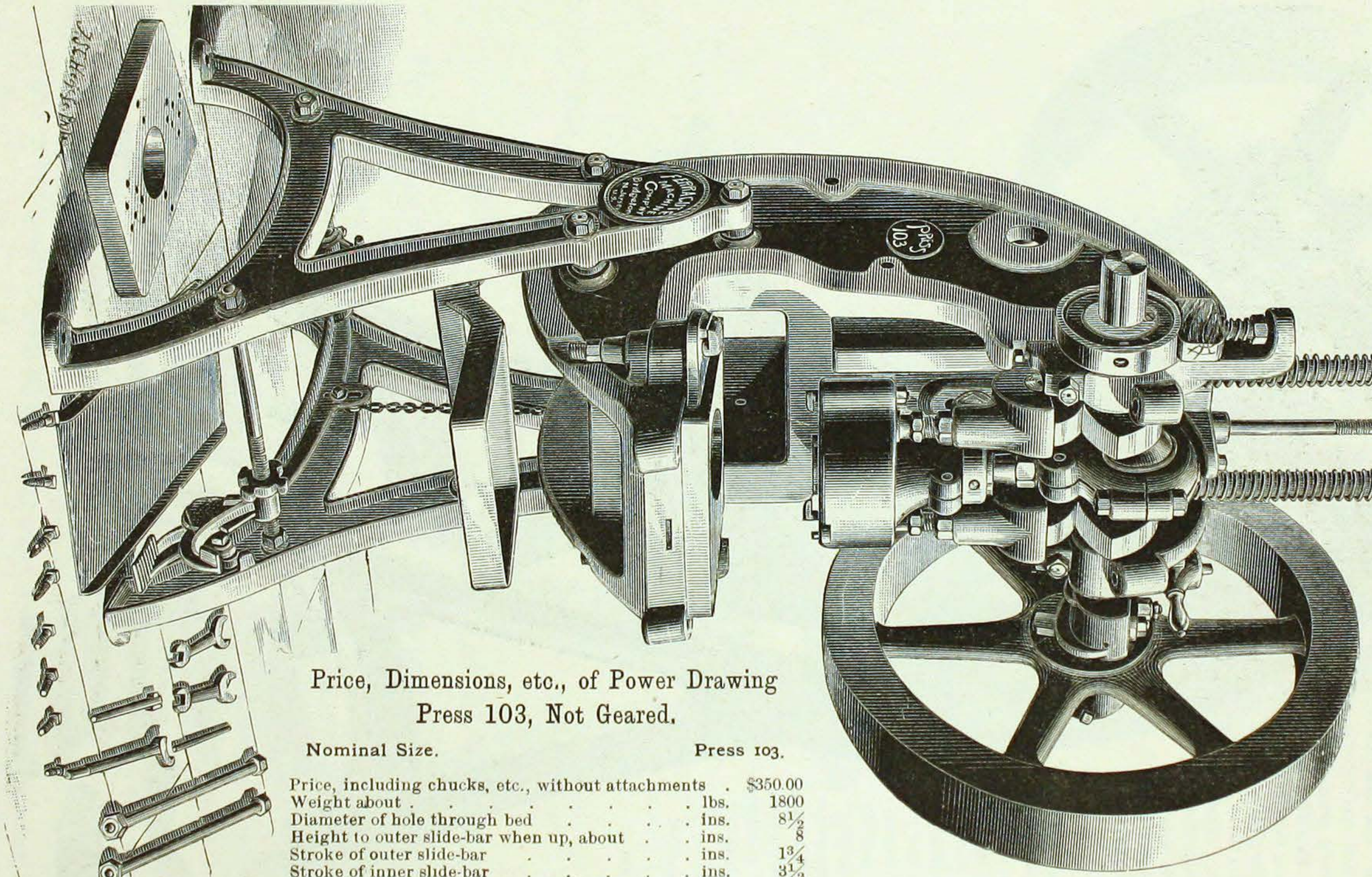
PRESS 103.

UPRIGHT POSITION, SCALE ONE-TWELFTH OF REAL SIZE.

This cut represents general shape and style of

POWER DRAWING PRESS 103.

WITHOUT ATTACHMENTS.

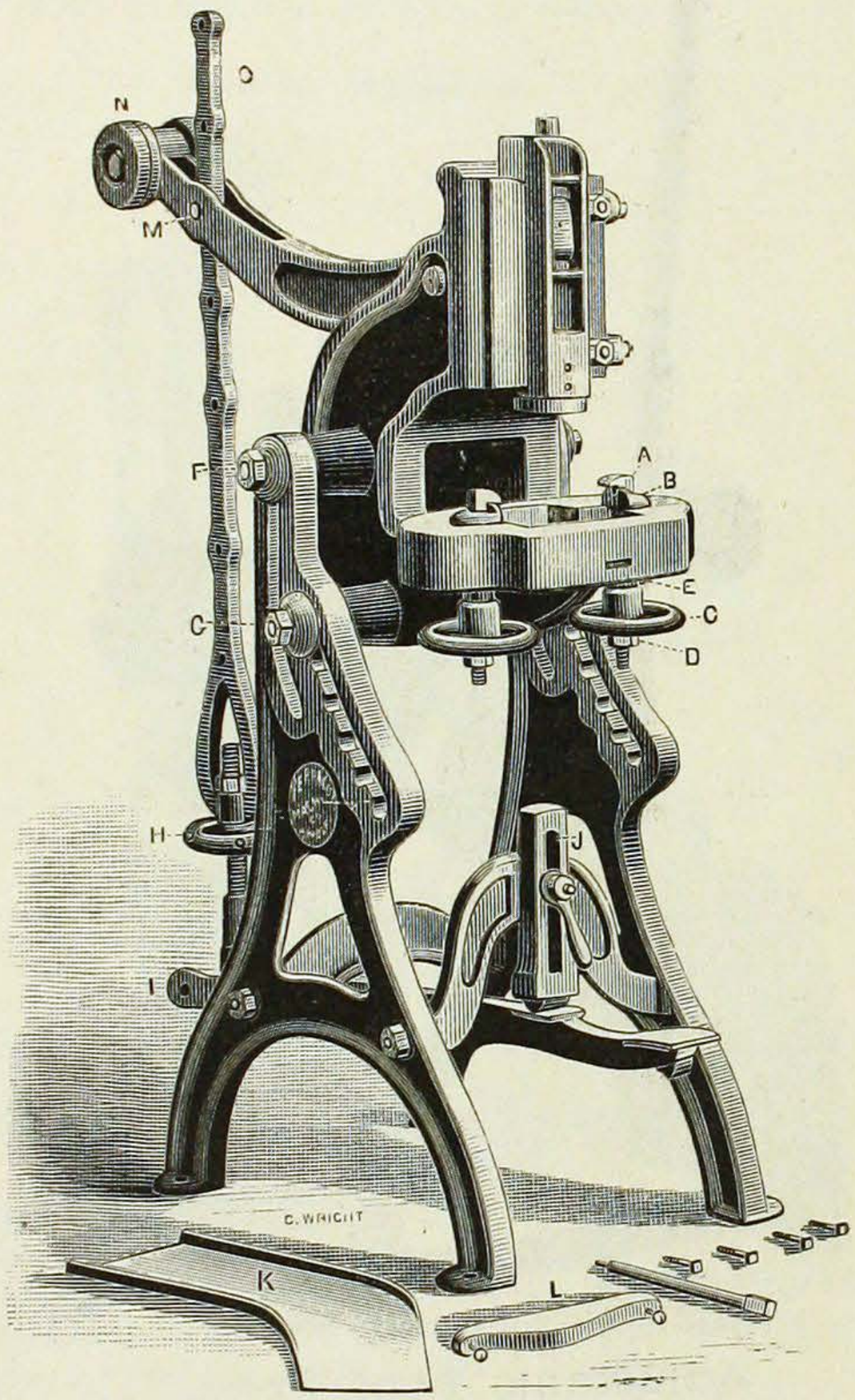


Price, Dimensions, etc., of Power Drawing Press 103, Not Geared.

Nominal Size.		Press 103.
Price, including chucks, etc., without attachments		$350.00
Weight about	lbs.	1800
Diameter of hole through bed	ins.	8½
Height to outer slide-bar when up, about	ins.	8
Stroke of outer slide-bar	ins.	1¾
Stroke of inner slide-bar	ins.	3½
Adjustment of outer slide-bar, about	ins.	1¼
Adjustment of inner slide-bar, about	ins.	2½
Greatest diameter blanks suitable to be cut	ins.	8½
Greatest diameter of work when drawn	ins.	7
Greatest depth of work with above diameter	ins.	⅝
Smaller diameters can be drawn deeper		—
Diameter of fly-wheel	ins.	33
Width of fly-wheel	ins.	5
Weight of fly-wheel, about	lbs.	460
Speed per minute, about	rev.	100
Extreme height from floor to highest part	ins.	89

PRESS 243.

SCALE ONE-SIXTEENTH OF REAL SIZE.



Adjustable Foot Press.

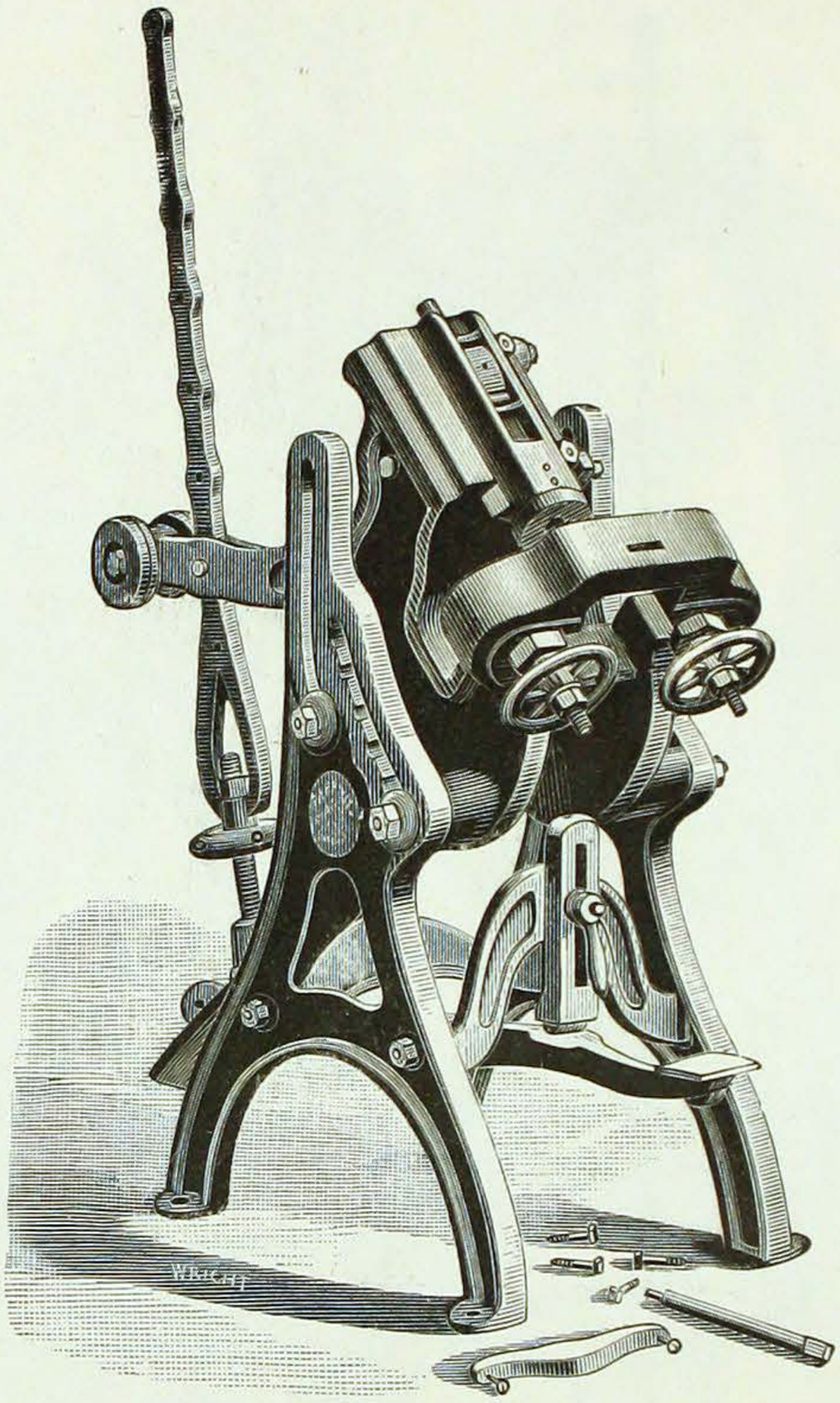
UPRIGHT POSITION.

To change to inclined position, loosen the leg nuts F, G, take out the bolt M, and lower frame, with studs at G resting in any notch desired; tighten nuts and put bolt M in hole lower down, and adjust by the hand wheel and nut at H and the treadle stop J to suit dies.

Press 243 is shown upright in the above cut, and in the inclined position on page 78. It is especially adapted for making condensed milk, oyster, lobster, salmon, meat, vegetable, and fruit cans, up to and including one gallon size. Also paint, spice, and varnish cans, small cut tinware and thin brass and sheet-iron work, not over 6½ inches diamcter. It is also well adapted for cutting cardboard and paper goods, and a great variety of odd work. It is very solid and heavy in all its parts, and amply strong for all the above articles, yet runs easily on ligther work. The improvements embodied in this press will enable the operator to set dies quickly, easily, and securely, and to produce more work than on other styles of presses, and with less wear of the dies. The new features are the legs built so that the frame can be set at any desired angle in one minute, and the improved shapes of the parts, all of which have been made much heavier than in the old press (as first built), while the price is the same, only $80.

PRESS 243.

SCALE ONE-SIXTEENTH OF REAL SIZE.



Adjustable Foot Press.

INCLINED POSITION.

To change to upright, loosen the four leg nuts, take out the pitman bolt and raise frame, with studs resting in top notches, then tighten nuts and put bolt into its hole in pitman. Upright position is shown on page 77.

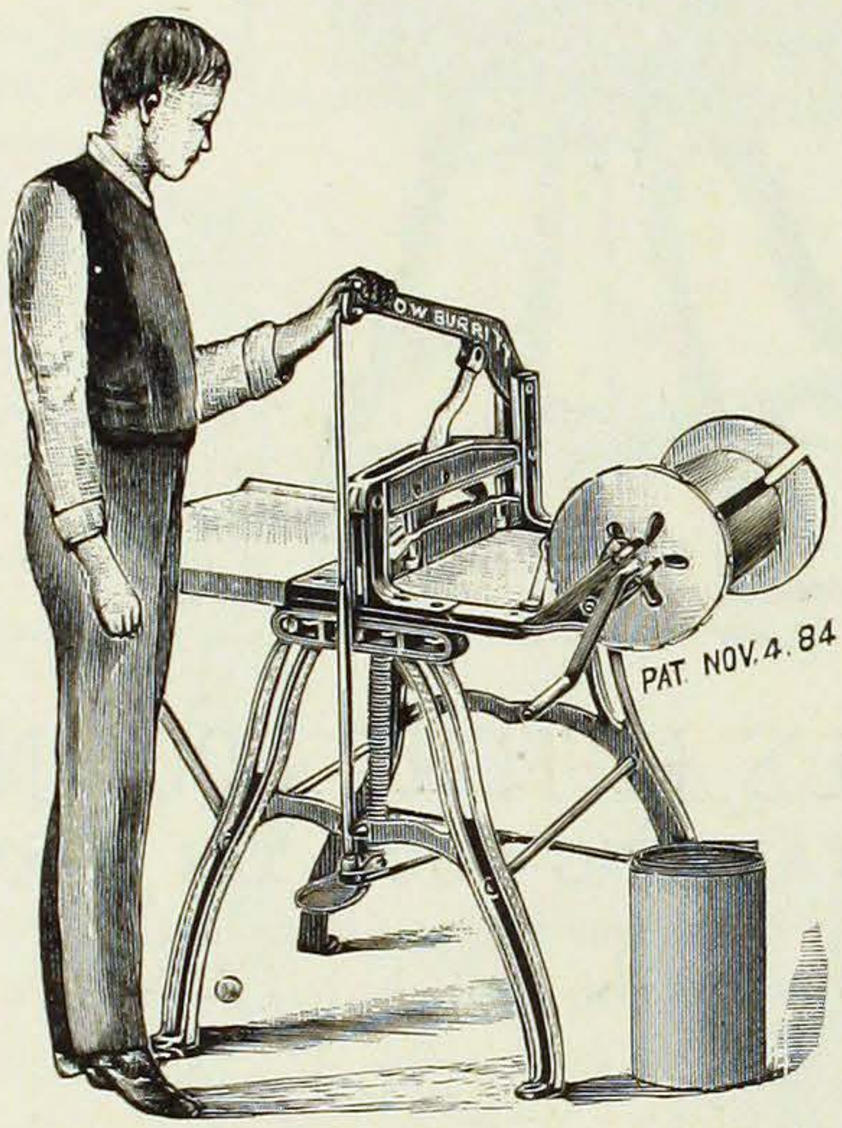
Press 243 is the latest and best for can-makers' use, and the only Foot Press in the market (not infringing patents) which adjusts from upright to inclined position without altering the height of front of bed. This is accomplished by the peculiar shapes of the slots in the legs, and it is a decided advantage to the operator not to raise the dies to a higher position when inclined. For work that is formed and lifted in the dies, the inclined position is generally preferred, as the article made then slides by force of gravity out through back of press and down the shute K (see page 77), instead of being knocked out by the opertor. This press is provided with O. Smith's patent die-clamps, A D, swivel pitman H, and adjustable treadle stop J ; also with rubber bumpers, etc. Size of hole in bed is 6½ inches square. Distance back from centre of slide-bar to frame, 6 inches. Height from bed to slide-bar, 2 to 5½ inches. Extreme height, 53 inches. Weight, 540 pounds. The bottom of slide-bar (shown round in cut) is now made oval with two bolt-holes for fastening large or irregular dies. Price, $80.

O. W. BURRITT'S

PATENT CROSS LOCK-SEAMER.

FOR PUTTING TOGETHER ROOFING STRIPS.

Patented November 4, 1884.



Cut of Cross Seamer, showing drop table in use and roll as slipped from the roll-former.

1. This Cross-Lock Seamer is made with leg standards, or for shop bench without the legs.
2. It makes single or double lock as needed.
3. The Cross-Locks do not slip.
4. It is noiseless in the working. No pounding or defacing tin.
5. The lock is pressed to the under surface, leaving the upper side smooth.
6. This process is a great saving of solder if used.
7. This Machine forms the roll ready for the roof.

WILL FORM ANY DESIRED LENGTH.

DIRECTIONS.—Raise the front end of the stay-roll bar, that is hinged to bed plate-slip sheet under the follower and stay-roll and catch the edge to the roll-former; hook sheet to opposite edge, turn towards the operator until the sheet strikes the gauge pins, press down the treadle firmly and the lock is completed. The process is continued until the roll is finished, which can be lifted from the bearings and slipped from the former. Adjust the set screw to stay-roll bar to proper tension. Adjust table-gauge according to width of stock, Either end of roll-former can be adjusted to draw evenly, insuring a straight strip.

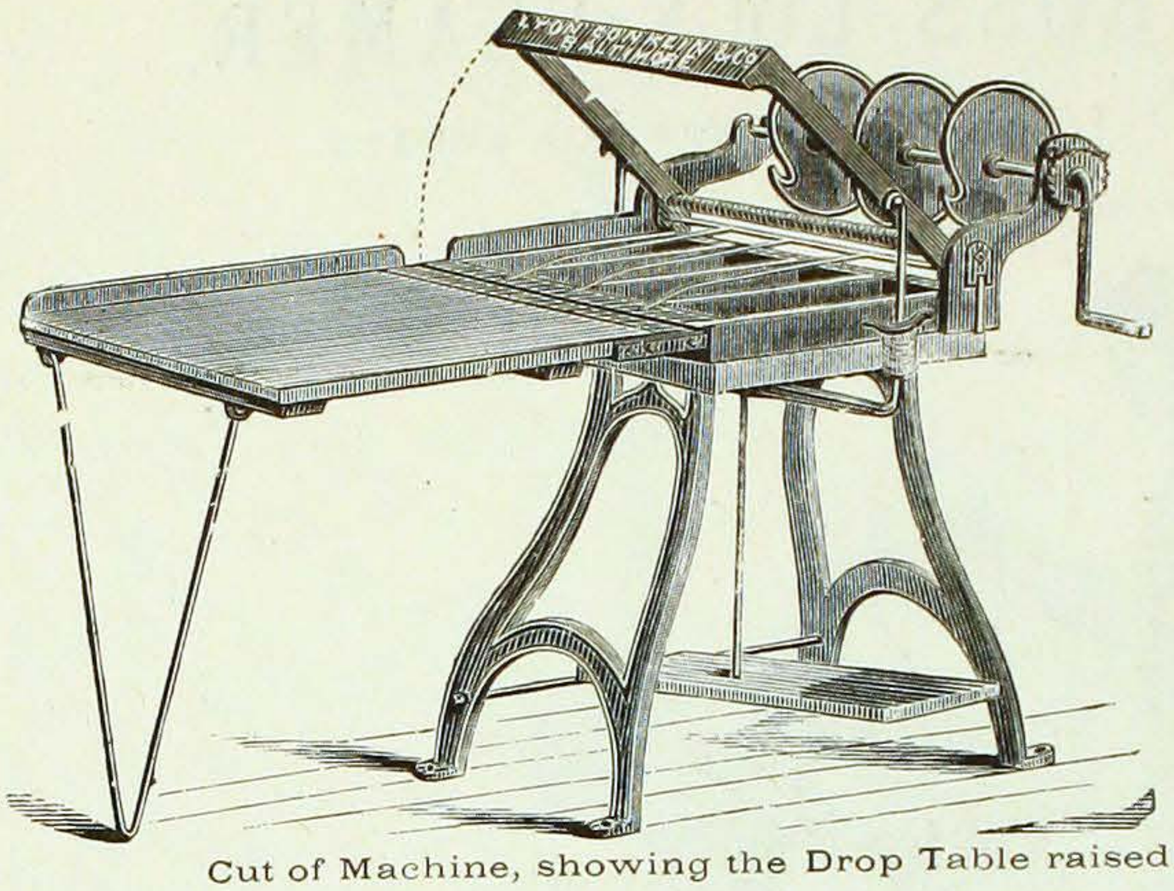
☞ Always keep the bearings oiled.

Twenty-eight-inch table-gauge is set for 20-inch strip when leaving the factory. We furnish two sizes,

20 inch . . . . . $38.00 | 28 inch $45.00

When ordering the Cross-Lock Seamers, state size.

PATENT ROOFING SEAMER.



Cut of Machine, showing the Drop Table raised in position to operate.

The Machine being simple and very durable is easily understood and never gets out of order.

The sheets of tin need no special preparation, but can be edged as they come from the box in the usual manner. There are two sizes, as follows:

20 inch Machine, which will put together Tin 14 and 20 inches . $45.00 net.

28 inch Machine, which will put together Tin 14, 20, and 28 inches . 50.00 net.

We strongly recommend the 28-inch Machine, which costs very little more, and which will put together both 20 and 28 inches should your wants require both.

Every Machine Guaranteed.

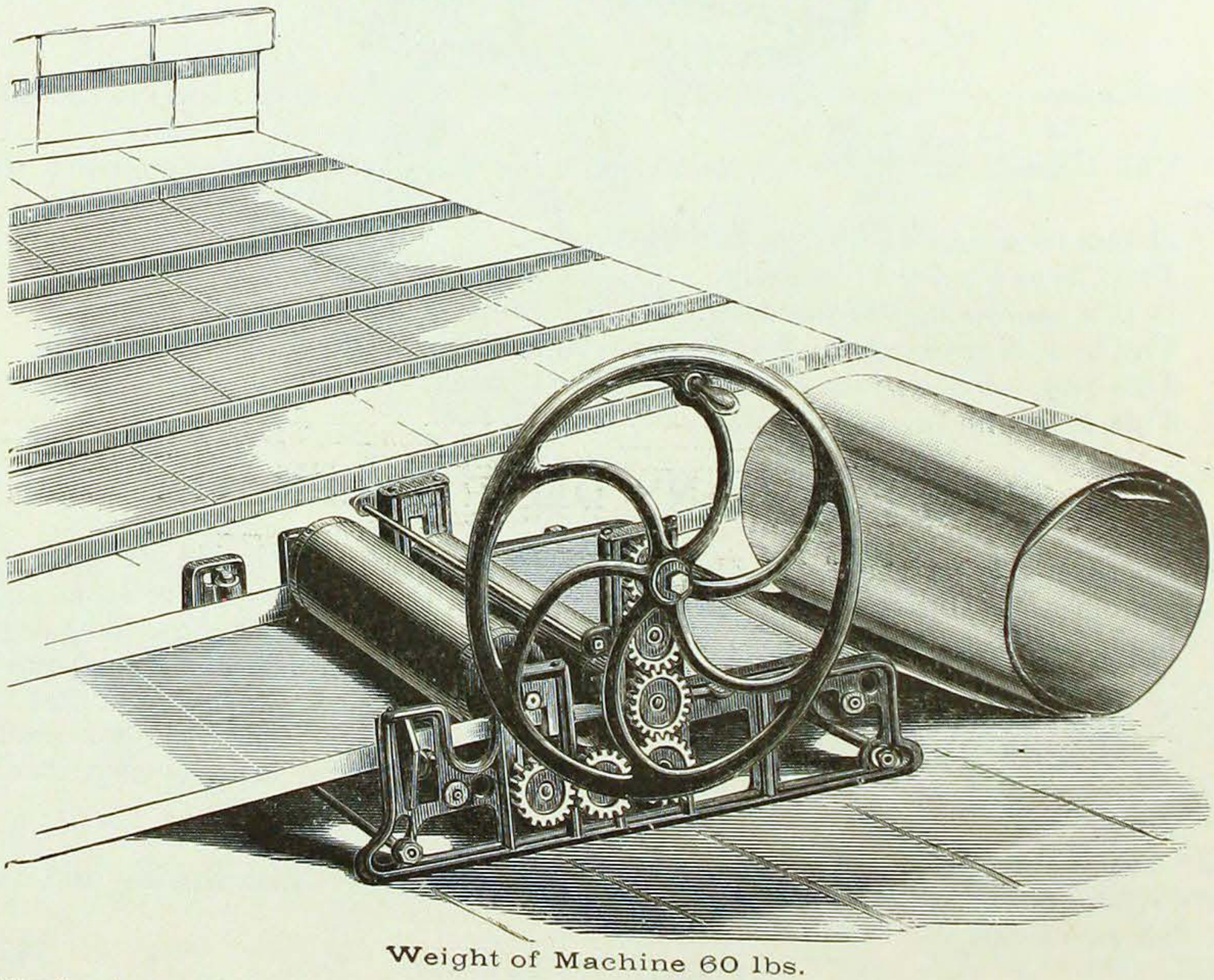
W. C. BELL'S PATENT ROOFING EDGER.

FOR STANDING-LOCK TIN ROOFING.

Patented September 7, 1880.

WARRANTED TO WORK PERFECTLY.

Edges Left Straight and Smooth.



Both Edges Turned at Once.

Weight of Machine 60 lbs.

Directions for using sent with each Machine. When ordering please state whether for common or wide lock.

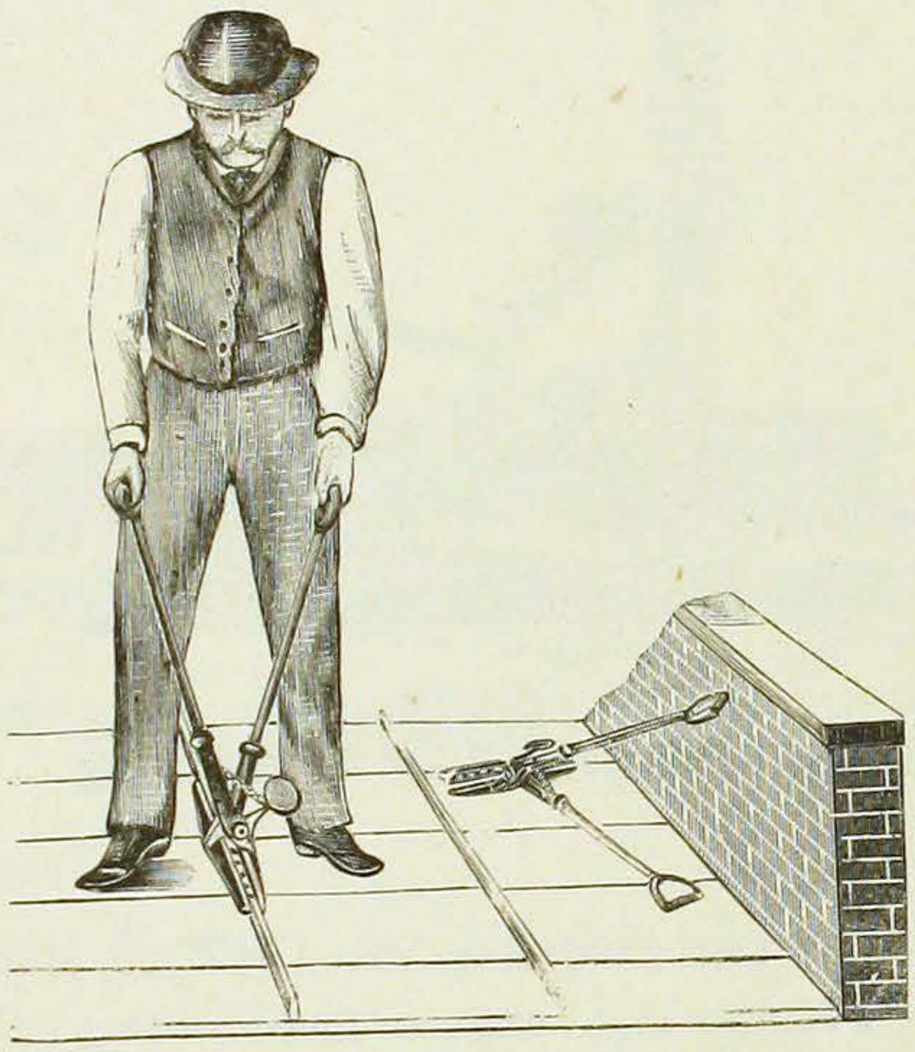
Common Gauge turns 1 and 1¼ inch . . $30.00 net. | Wide Gauge turns 1¼ and 1½ inch . . . . $30.00 net.

O. W. BURRITT'S

PATENT DOUBLE SEAMERS.

FOR STANDING LOCK ROOFING.

Patented November 14, 1871. Improved 1881.



Cut of Double Seamer turning over edge. The treadle attached closes down the edge.

DIRECTIONS.—Edge tin with ordinary roofing tongs. Two pairs constitute a set of seamers, the Double Seamer following directly after the single seamer. In double seaming hips and ridges, or where there are many laps of tin, do not take hold of as much at once. Keep bolt nut well screwed up and set to its place. Avoid placing the centre of bars over cross locks in double seaming.

☞ We always ship the Seamers fitted for I C tin, unless expressly ordered for I X plate. Seamers made for I X tin will always be for 1¼ and 1½ tongs made to order.

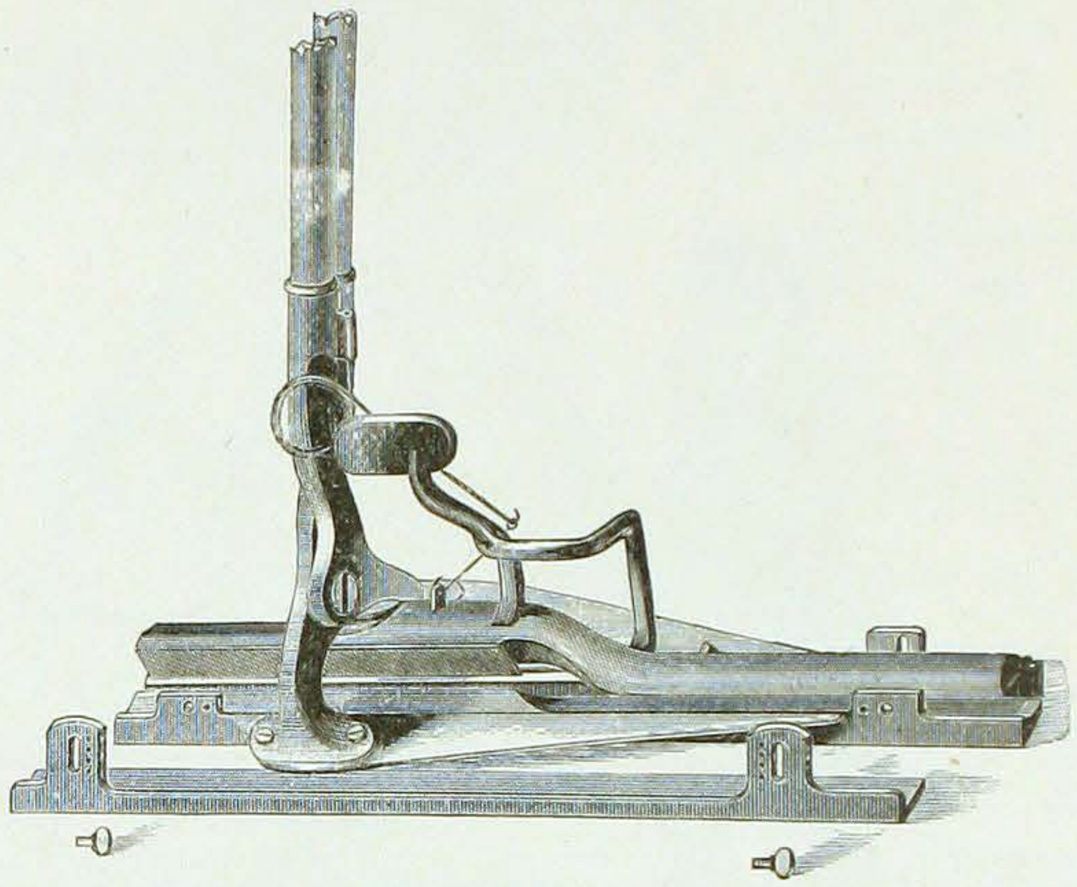
When ordering Seamers please state whether for common or wide lock.

Two pairs constitute a set of Common Gauge adapted to 1 and 1¼ Tongs. Price, $30

Two pairs constitute a set of Wide Gauge for 1¼ and 1½ Tongs Price, $30

ROOFING DOUBLE SEAMER.

Patented March 16, 1875.

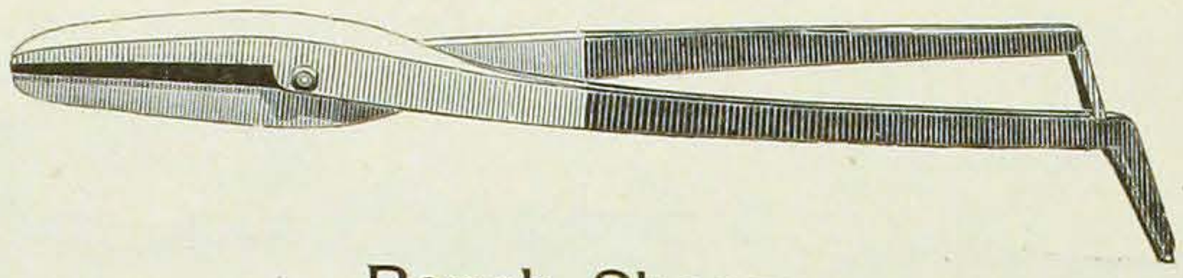


Kenney's Patent—For Standing Lock.

This Machine consists of two clamps, operated by long levers or handles. To one of these clamps is hinged a double right-angular-faced folding bar, operated by foot lever. To work the Machine, the levers are opened, clamps placed over the standing edge, with vertical face of folding bar to the work; then closed and held firmly. By pressing down the foot lever, the tin is turned a little below a right angle; the Machine is then slipped along half its length and the operation repeated, the horizontal face of the folding bar completing 8½ inches at each turn—thus there are two operations taking place at each downward stroke of the foot lever. After going over the work once, the gauges are raised and second operation completes the double seam. The clamping arms take strong hold upon the work, preventing the machine raising up or drawing of tin, at the same time furnishing the workmen a direct hold upon the roof and great degree of safety. In double seaming a roof of very steep pitch, the leverage is such as to enable the machine to be worked by hand altogether. It will begin and finish a seam at either end of the roof, the operator standing in an erect position. These Machines are adjustable to different widths of seam and qualities of tin. All parts are made to gauge, so that a duplicate part can be furnished at any time. It will not break tin; will make an even and tight joint and save labor. Only one Machine is required to double seam locks of different widths. The Machine is light, only weighing 18 lbs.

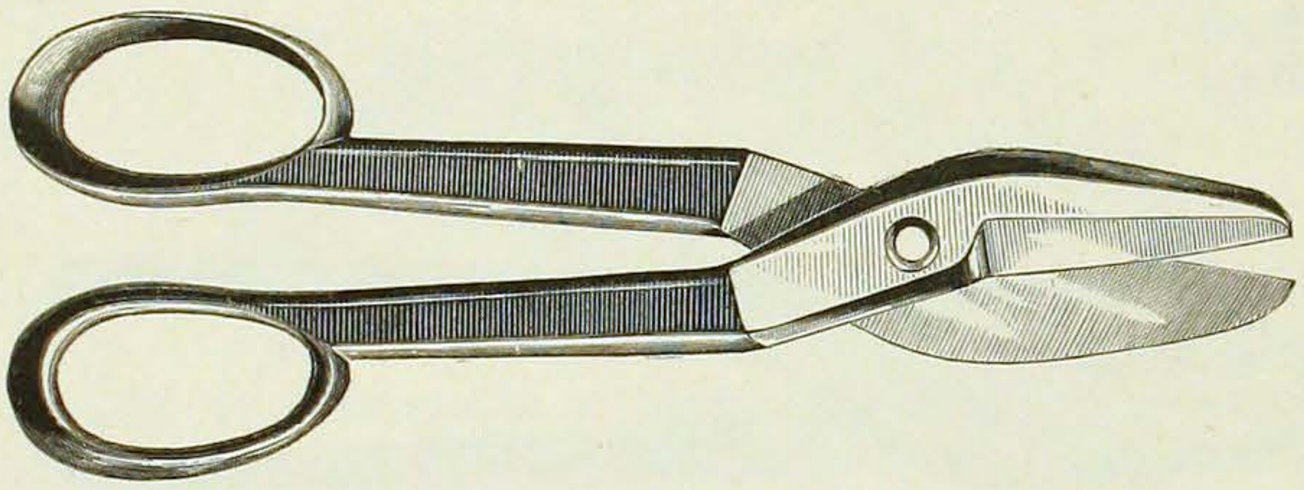
Kenney's Roofing Double Seamer, for tin roofing $20.00

TINNERS' SHEARS.



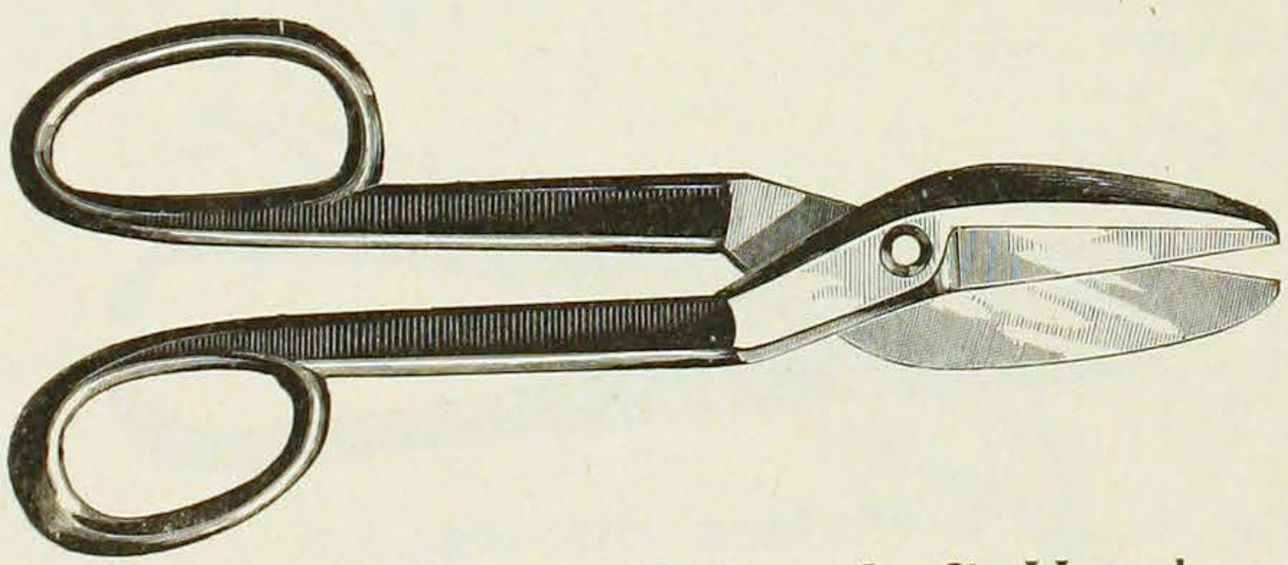
Bench Shears.

No. 00.	Bench, cut 12 inches	each	$13.50
No. 0.	Bench, cut 10½ inches	each	12.00
No. 1.	Bench, cut 9 inches	each	8.00
No. 2.	Bench, cut 8⅝ inches	each	7.00
No. 3.	Bench, cut 8⅜ inches	each	6.00
No. 4.	Bench, cut 8 inches	each	5.00
No 5.	Bench, cut 7 inches	each	4.00
No. 6.	Bench, cut 6 inches	each	3.50
Elbow Bench		each	5.25
Elbow Bench, Extra Heavy, cut 6 inches		each	12.50



Hand Shears or Snips—Left Hand.

No. 6½.	Hand, cut 4½ inches	each	$3.00
No. 7.	Hand, cut 4 inches	each	2.50
No. 8.	Hand, cut 3½ inches	each	2.00
No. 9.	Hand, cut 3 inches	each	1.50
No. 10.	Hand, cut 2½ inches	each	1.40



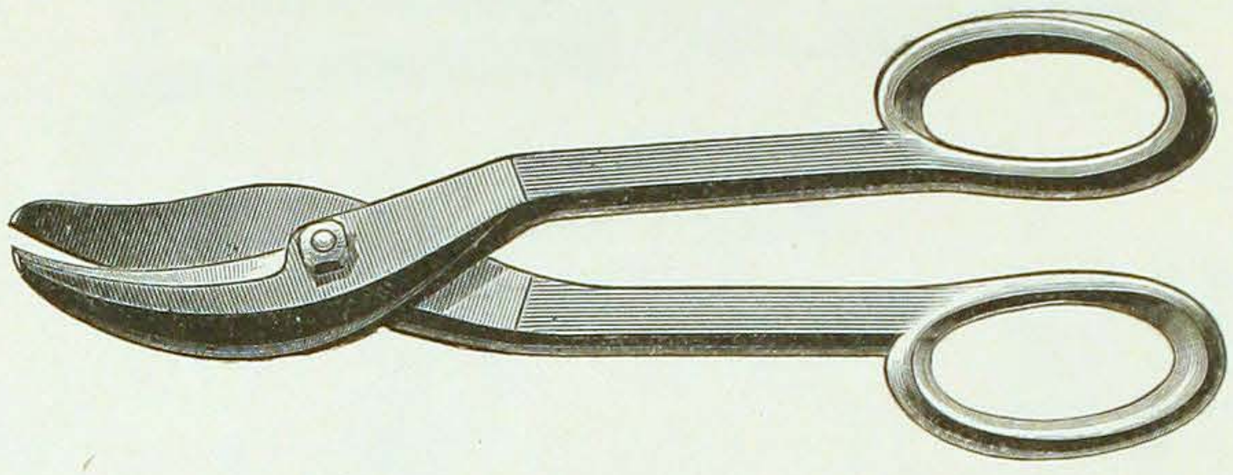
German Pattern Snips—Left Hand.

German Pattern Snips are the same as the others, except the bow-handles are larger and heavier.

No. 1.	Hand, cut 4½ inches	each	$3.00
No. 2.	Hand, cut 4 inches	each	2.50
No. 3.	Hand, cut 3½ inches	each	2.00
No. 4.	Hand, cut 3¼ inches	each	1.75
No. 5.	Hand, cut 3 inches	each	1.50
No. 6.	Hand, cut 2½ inches	each	1.40

Right hand Snips cut upon the right of the blade; left hand Snips cut upon the left of the blade, but all are used with the right hand. Left hand are always sent unless right are named in the order.

TINNERS' SHEARS.

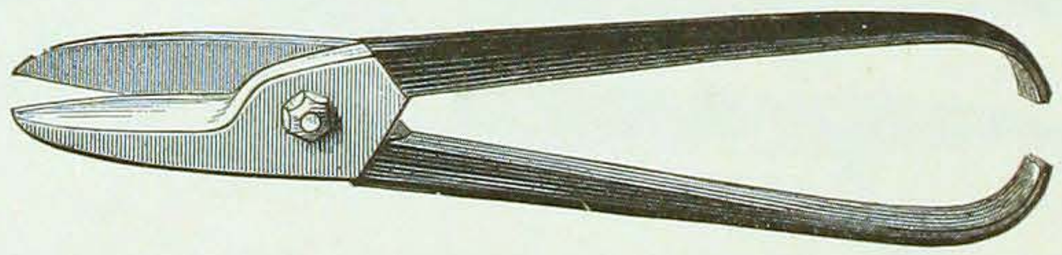


Circular Hand Shears.

No. 7.	Circular, Hand	each	$3.50
No. 8.	Circular, Hand	each	3.00
No. 9.	Circular, Hand	each	2.50
No. 10.	Circular, Hand	each	2.25

Straight Handle Shears.

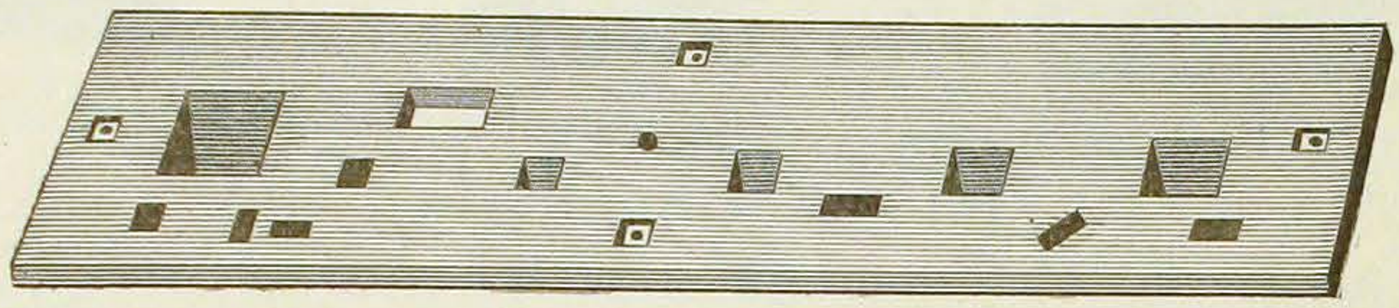
No. 7.	Hand, cut 4 inches	each	$2.50
No. 8.	Hand, cut 3½ inches	each	2.00
No. 9.	Hand, cut 3 inches	each	1.50
No. 10.	Hand, cut 2½ inches	each	1.40



Platers' Shears.

No. 1.	Cut 3½ inches	each	$2.25
No. 2.	Cut 3 inches	each	2.00
No. 3.	Cut 2½ inches	each	1.75
No. 4.	Cut 2 inches	each	1.50
No. 5.	Cut 1½ inches	each	1.25
No. 2.	Circular	each	2 75
No. 3.	Circular	each	2.50
No. 4.	Circular	each	2.25

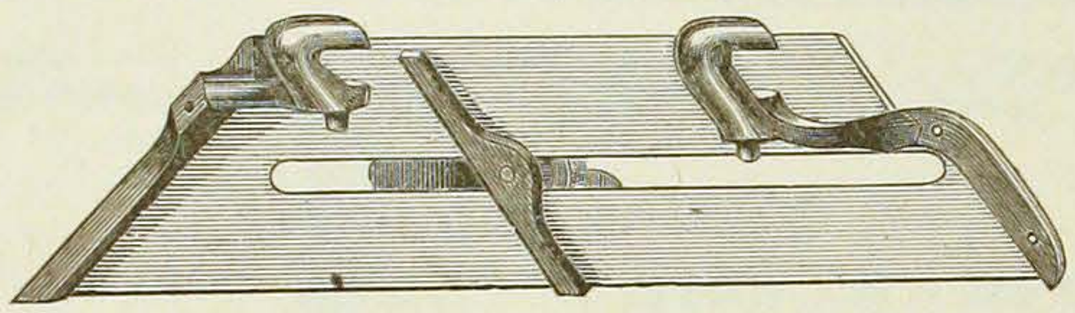
BENCH PLATES.



Cast Iron—Polished.

No. 1.	37 x 8 inches	each	$5.00
No. 2.	30 x 8 inches	each	3.00

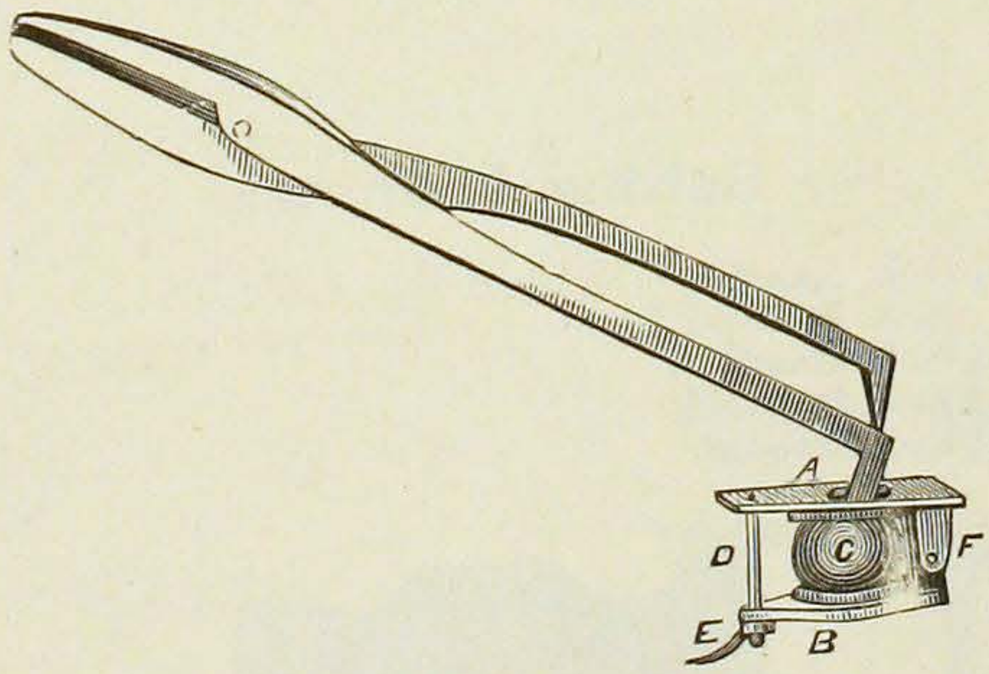
STOW'S PATENT GAUGE.



The above gauge is constructed so that it can be readily attached to No. 4 Bench Shears. It is intended to aid the workman in clipping the corners of tin for roofing, or for forming square pans, etc. It will prove of great service in such work.

Stow's Patent Gauge Attachment	each	$4.00

CAMP'S PATENT SHEAR HOLDER.



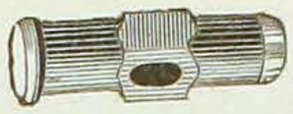
A useful invention, easily inserted in the bench, and designed for holding shears at any required angle.

Camp's Patent Shear Holder	each	$2.50

HAMMERS.



No. 1.



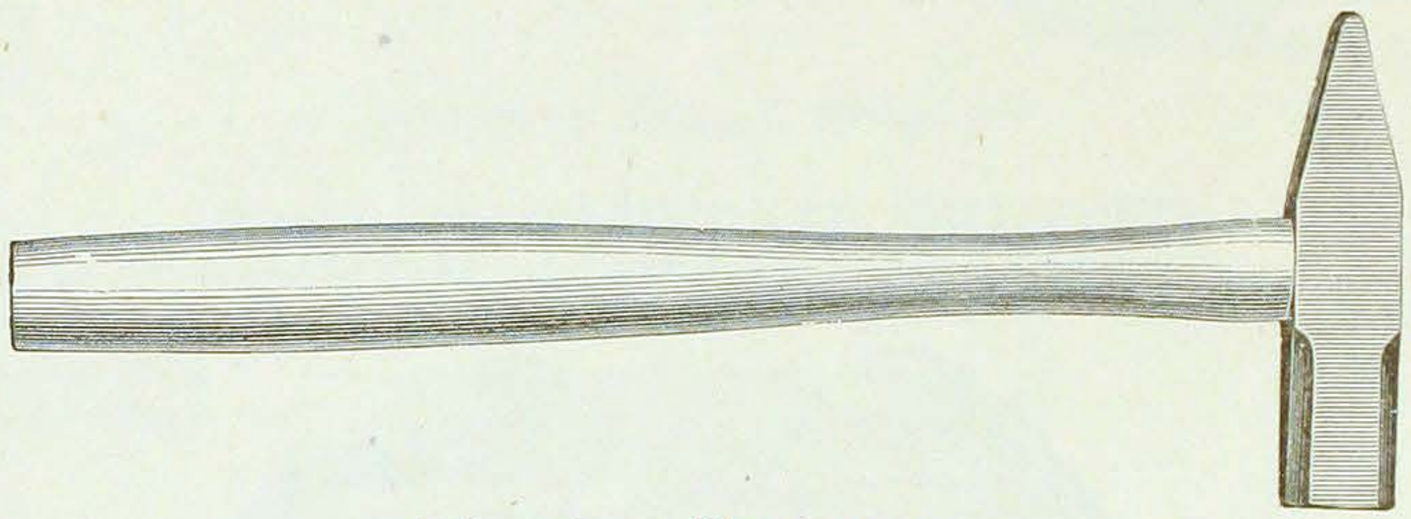
No. 2.



No. 4.

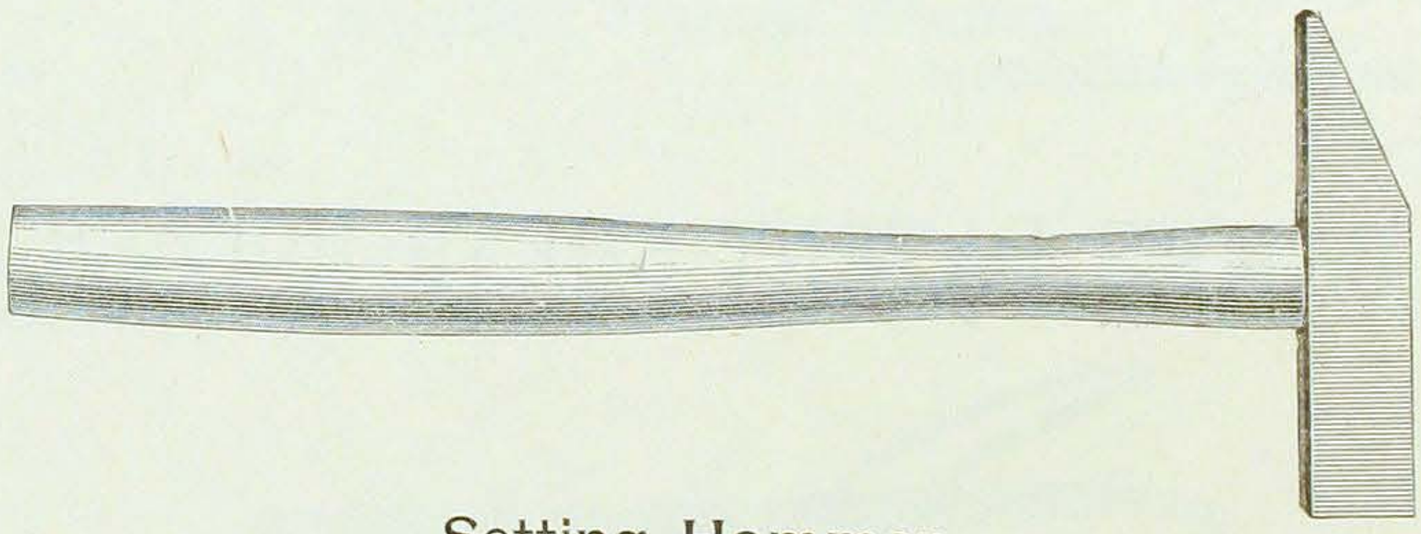
Raising Hammers.

No. 1.	Raising Hammer	each	$2.25
No. 2.	Raising Hammer	each	1.75
No. 3.	Raising Hammer	each	1.25
No. 4.	Raising Hammer	each	.75
Handles		per dozen, extra	1.25



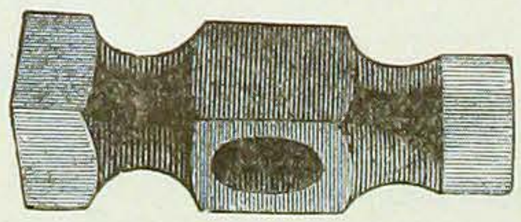
Riveting Hammer.

		Per Doz.	Each.
No. 0.	Heavy Work, Bright, 1½ inch, Handled	15.50	$1.30
No. 1.	Sheet Iron, Bright, 1⅛ inch, Handled	9.75	.82
No. 2.	Tin, etc., Bright, 1 inch, Handled	8.31	.70
No. 3.	Tin, etc., Bright, ⅞ inch, Handled	6.75	.57
No. 4.	Tin, etc., Bright, ¾ inch, Handled	5.31	.45
No. 5.	Tin, etc., Bright, ⅝ inch, Handled	4.75	.40



Setting Hammer.

		Per Doz.	Each.
No. 1.	Setting, Bright, 1⅛ inch, Handled	$9.75	$0.82
No. 2.	Setting, Bright, 1 inch, Handled	8.31	.70
No. 3.	Setting, Bright, ⅞ inch, Handled	6.75	.57
No. 4.	Setting, Bright, ¾ inch, Handled	5.31	.45
No. 5.	Setting, Bright, ⅝ inch, Handled	4.75	.40

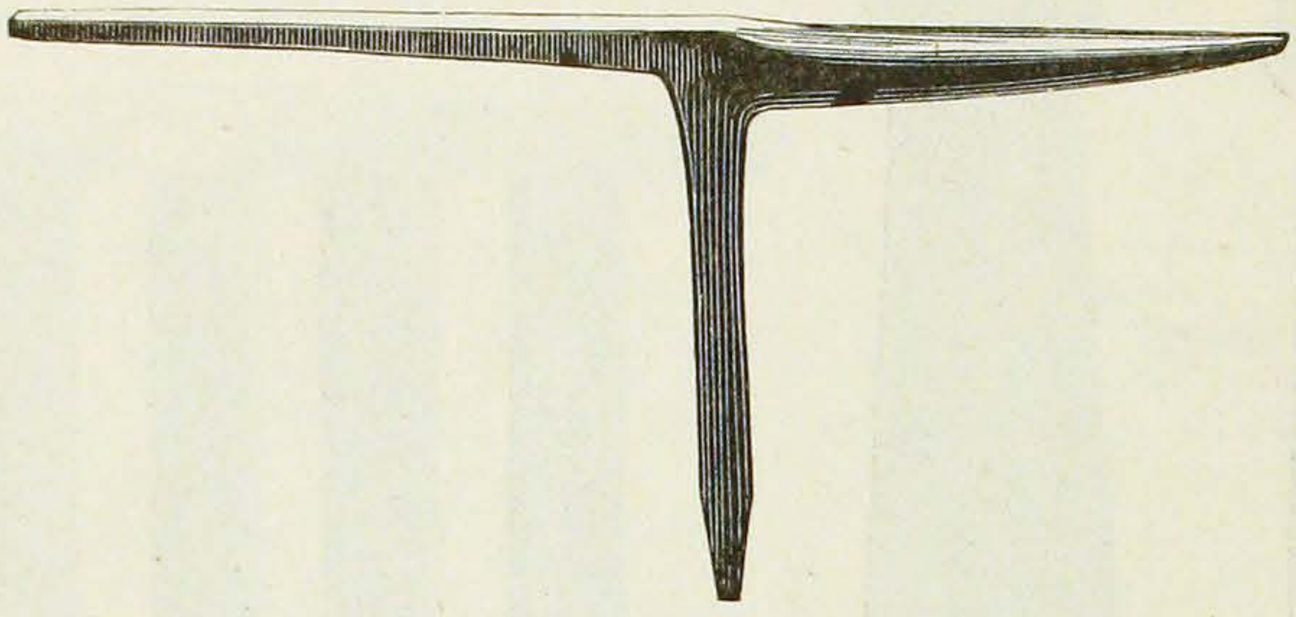


Planishing Hammer.

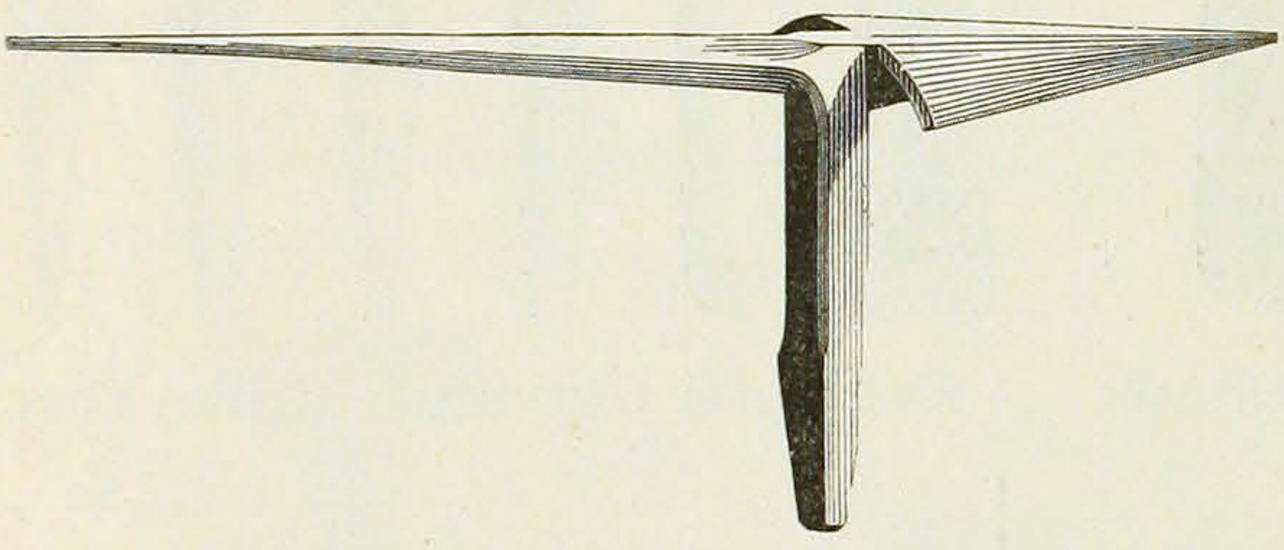
Planishing Hammers	per pound	$1.00

TINNERS' STAKES.

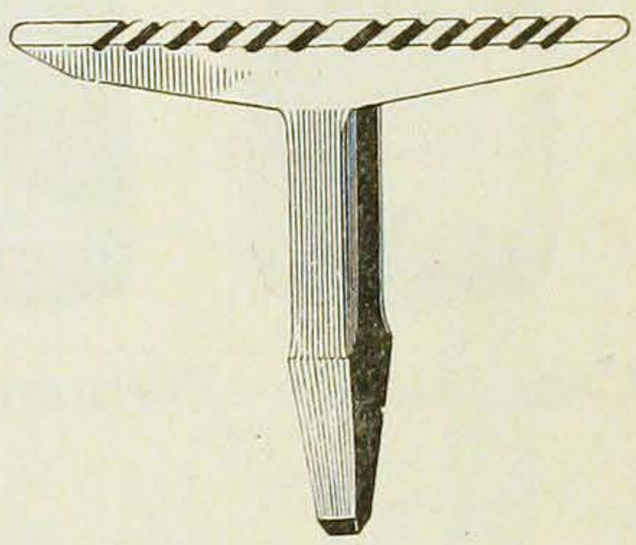
WROUGHT IRON, WITH STEEL FACES.



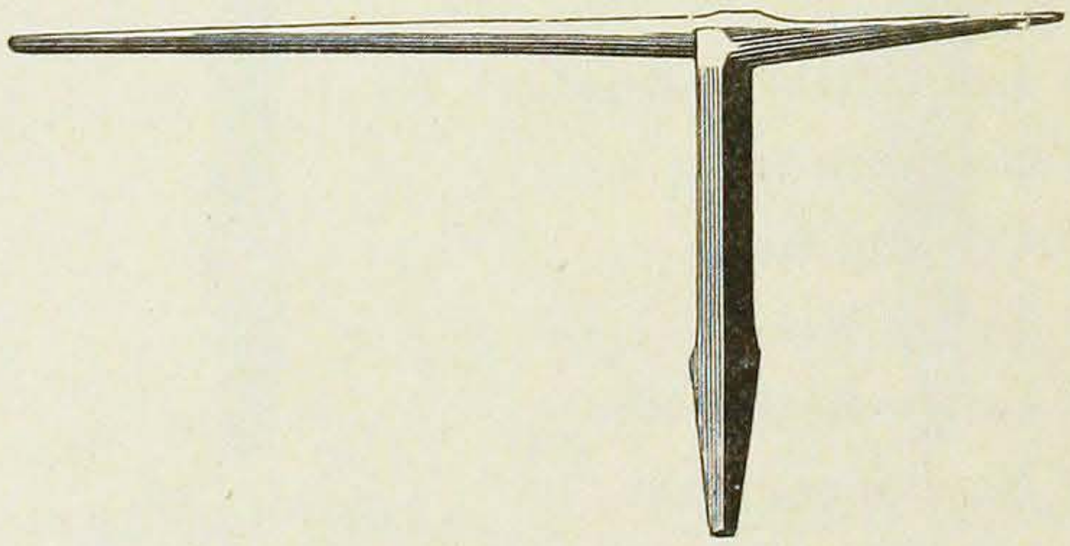
Beakhorn Stake.



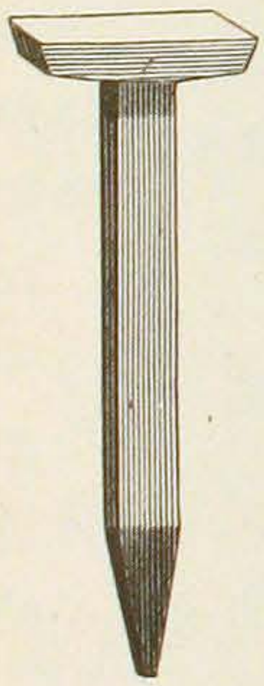
Blowhorn Stake.



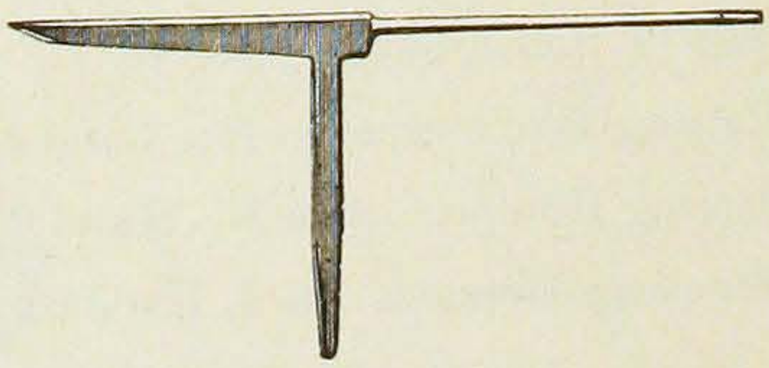
Creasing Stake.



Candle Mould Stake.

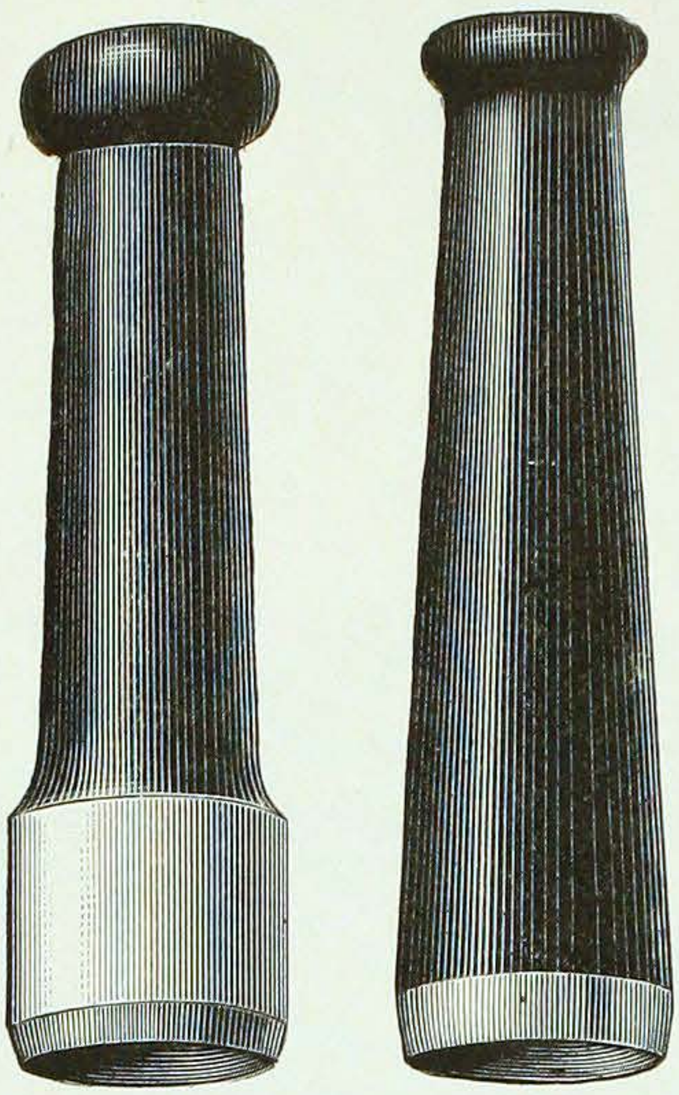


Square Stake.

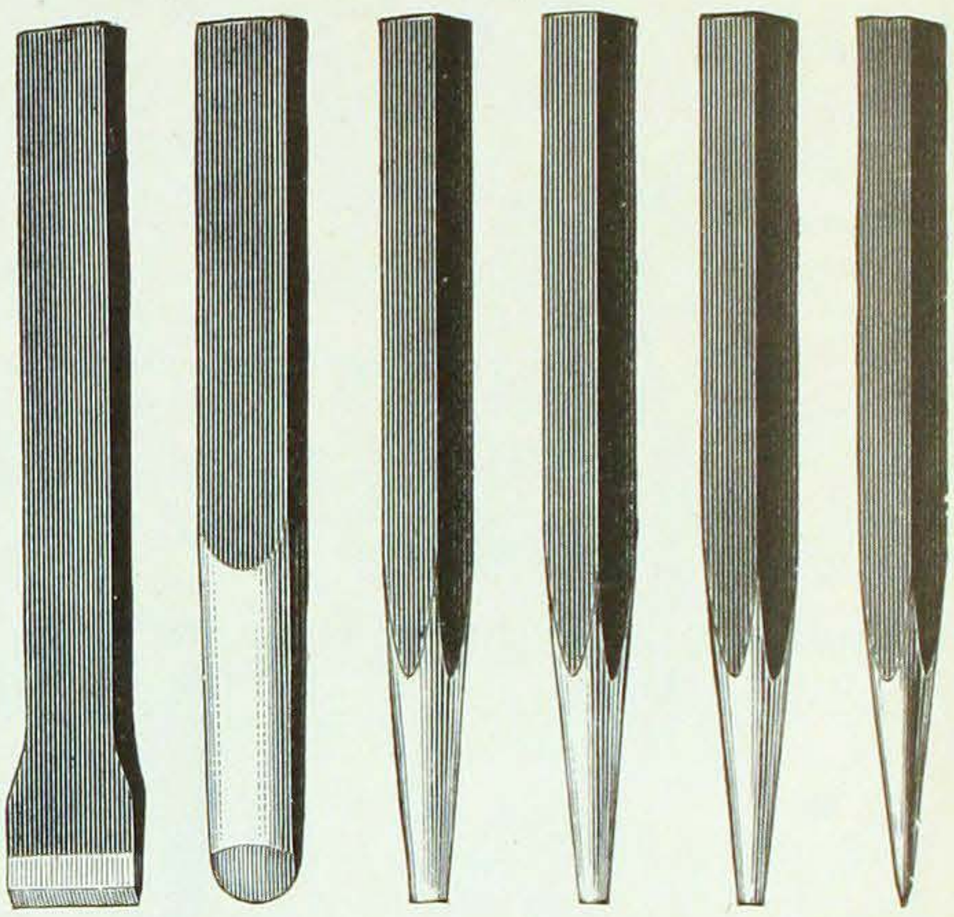


Needle-Case Stake.

PUNCHES.



Cast Shank. Wrought Shank.



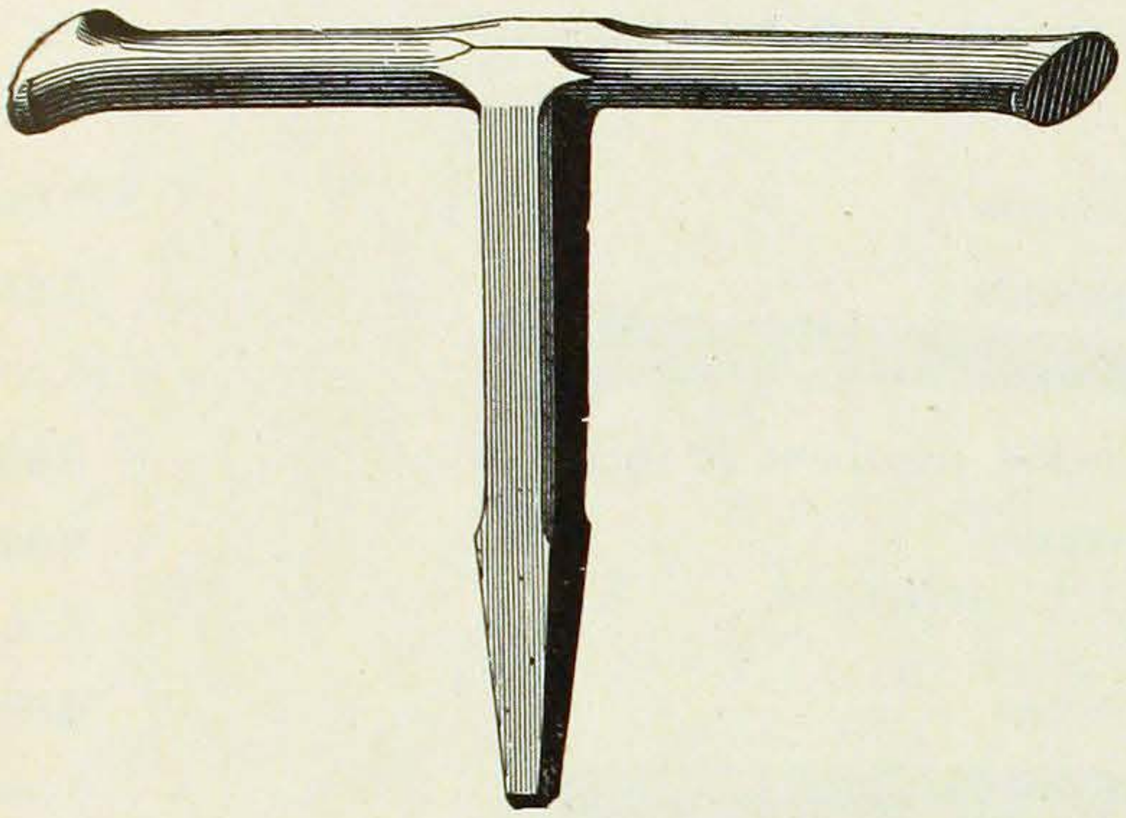
Set Solid Punches. ½ Size Cut.

ARTICLES INCLUDED IN A SET OF TINNERS' TOOLS.

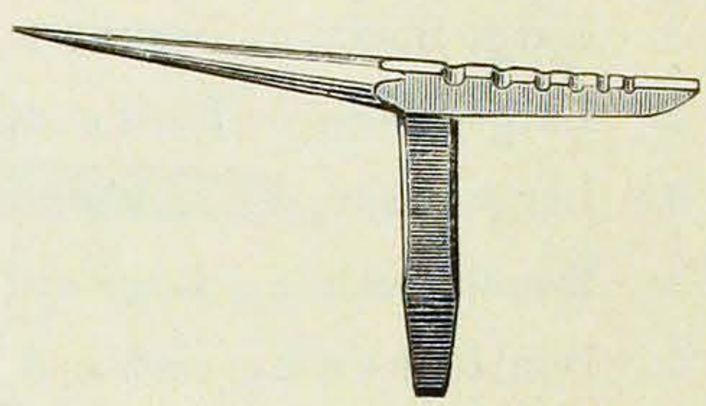
1 Large Stake or Beakhorn, No. 1	$15.00
1 Blowhorn Stake	5.00
1 Creasing Stake	4.00
1 Square Stake	3.00
1 Candle-Mould Stake	2.75
1 Needle-Case Stake	2.25
1 Set Hollow Punches, one each ½, ¾, 1, 1½, 1¾ inch	5.50
1 Set Solid Punches, 4 Punches and 2 Chisels	.72
1 Pair of Bench Shears, No. 4	5.00
1 Raising Hammer, each No. 1 and 4, Handled	3.20
1 Setting Hammer, each No. 2 and 3, Handled	1.20
1 Riveting Hammer, No. 5, Handled	.38
The above comprises a full set	$48.00

TINNERS' STAKES.

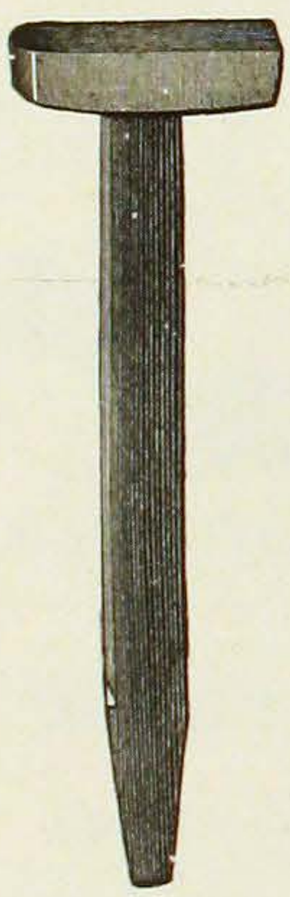
WROUGHT IRON, WITH STEEL FACES.



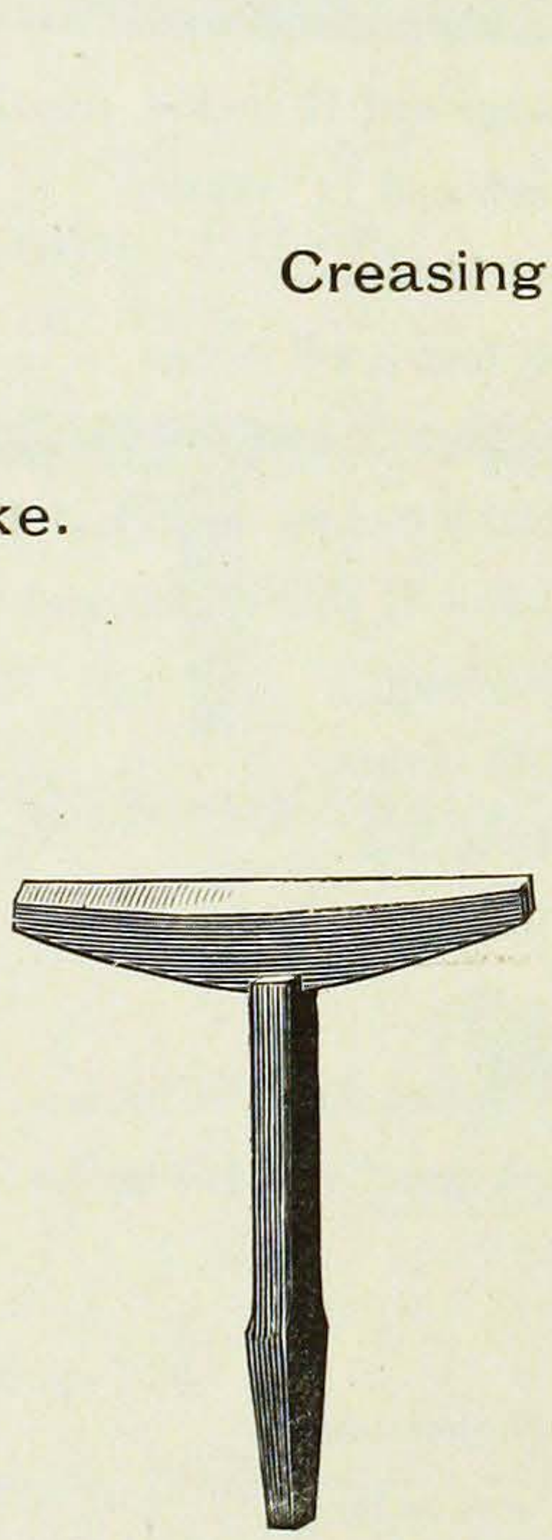
Double Seaming Stake.



Creasing Stake, with Horn.



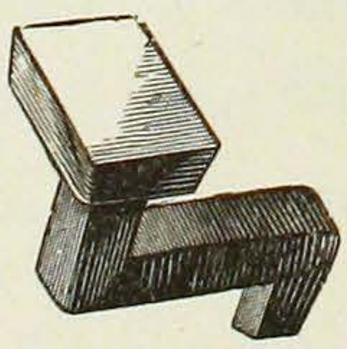
Coppersmith's Square Stake.



Hatchet Stake.



Bottom Stake.



Bevel-edged Square Stake.

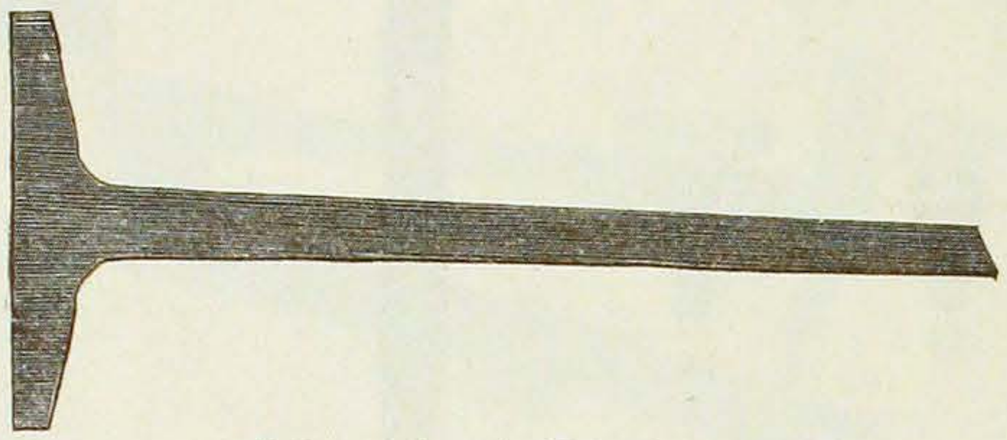
STAKES.

WROUGHT IRON AND STEEL.

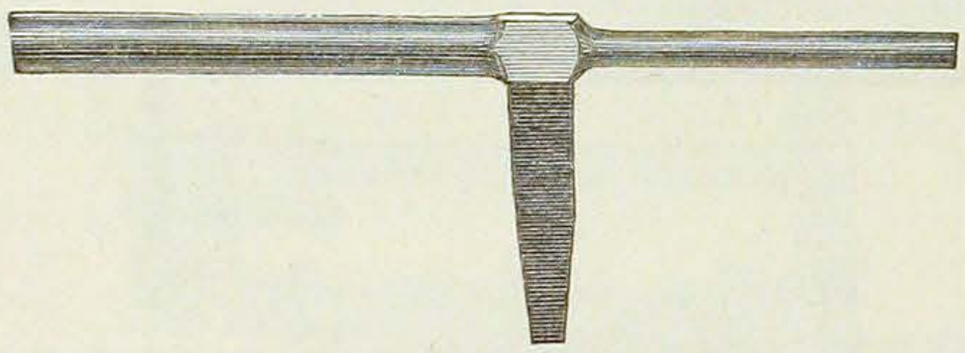
No. 1.	Large Stake, or Beakhorn, 45 pounds	$15.00
No. 2.	Large Stake, or Beakhorn, 40 pounds	13.25
No. 4.	Large Stake, or Beakhorn, 30 pounds	10.00
No. 1.	Double Seaming, large end 17 inches, small end 12 inches	9.00
No. 2.	Double Seaming, each end 11 inches	8.00
No. 0.	Conductor, each end 14 inches	6.00
No. 1.	Bevel-edged Square, face 3 x 5 inches	6.00
No. 2.	Bevel-edged Square, face 2½ x 4½ inches	5.00
	Common Blowhorn, large end 9 inches, small end 17½ inches	5.00
	Creasing, with Horn, round end 9½ inches, flat end 6½ inches	4.50
	Common Creasing, 14½ inches long	4.00
	Coppersmith's Square, 2⅝ x 4½ inches	3.50
	Common Square, face 2⅝ x 4½ inches	3.00
	Large Square, face 3½ x 5½ inches	7.00
	Small Square, face 2⅜ x 1½ inches	2.00
	Candle Mould, small end 18 inches, horn 8½ inches	2.75
	Needle-Case, flat end 8 inches, small end 10½ inches	2.25
	Tea-Kettle, with four heads	15.75
	Heads for Tea-Kettle, each	1.75
No. 1.	Hatchet, blade 16 inches long	5.00
No. 2.	Hatchet, blade 14½ inches long	4.25
No. 3.	Hatchet, blade 13 inches long	3.50
No. 4.	Hatchet, blade 11 inches long	2.75
No. 5.	Hatchet, blade 9 inches long	2.25
No. 6.	Hatchet, blade 7 inches long	1.75
No. 1.	Bottom, width 1¾ inches	1.00
No. 2.	Bottom, width 1½ inches	.80
No. 3.	Bottom, width 1¼ inches	.75
No. 4.	Bottom, width 1 inch	.50

TINNERS' STAKES.

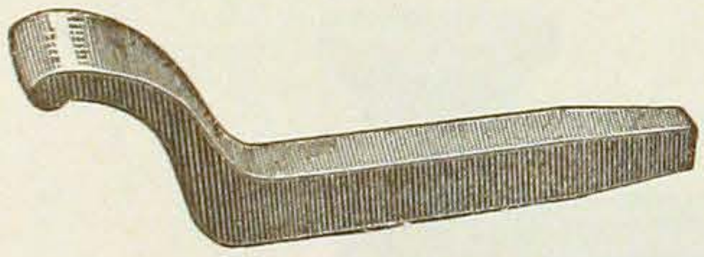
CAST IRON, WITH POLISHED FACES.



Mandrel Stake.



No. 1 Conductor Stake.



Bath-Tub Stake.

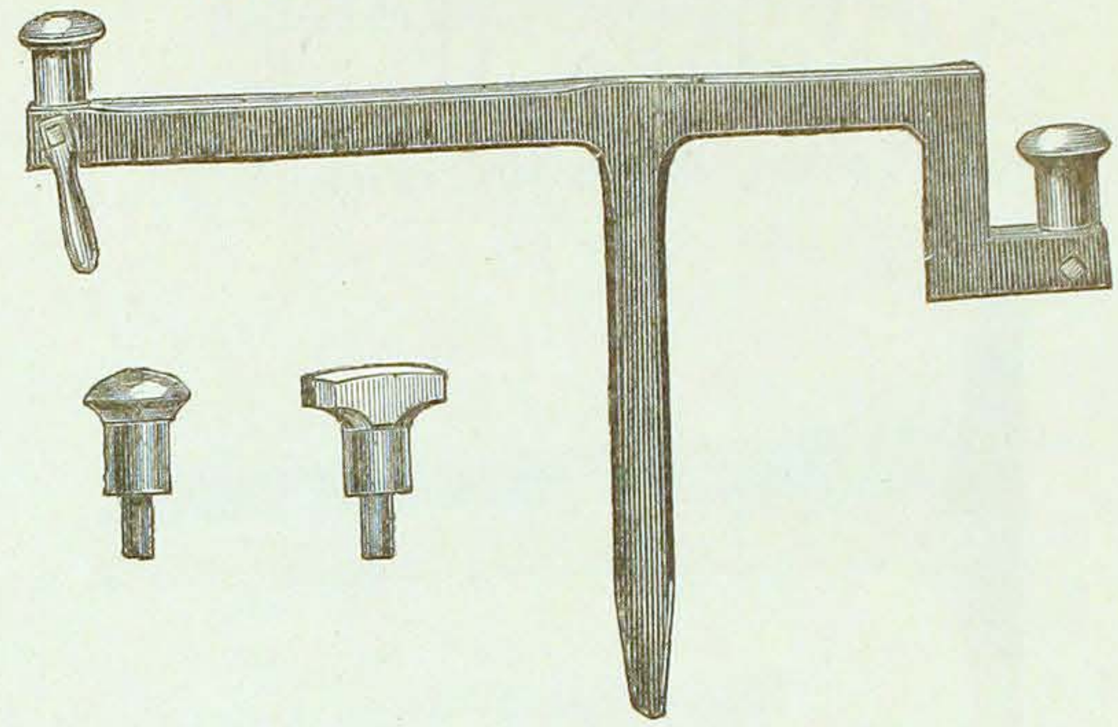


Round-Head Stake.

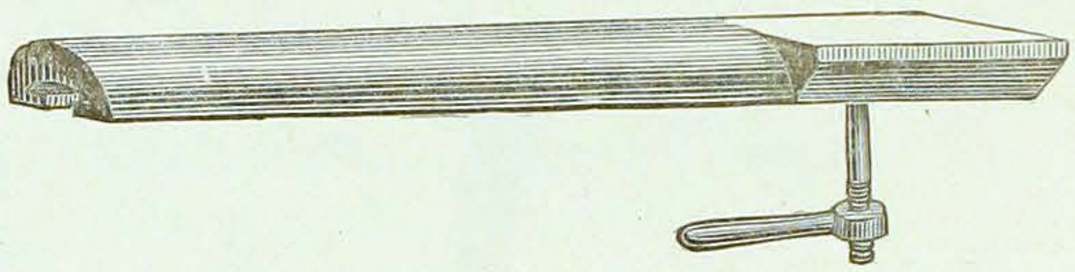
No. 00.	Mandrel, 5 feet long to the Standard	$10.00
No. 0.	Mandrel, 3 feet 4 inches long to the Standard	6.00
No. 1.	Mandrel, 2 feet 10 inches long to the Standard	5.00
No. 2.	Mandrel, 2 feet 6 inches long to the Standard	4.00
No. 3.	Mandrel, 2 feet 3 inches long to the Standard	3.00
No. 1.	Conductor, Turned, large end 15 inches, small end 11½ inches long .	4.00
No. 2.	Conductor, Turned, large end 14 inches, small end 10 inches long .	3.00
Round-Head		1.25
Bath-Tub		1.25

TINNERS' STAKES.

WROUGHT AND CAST IRON.



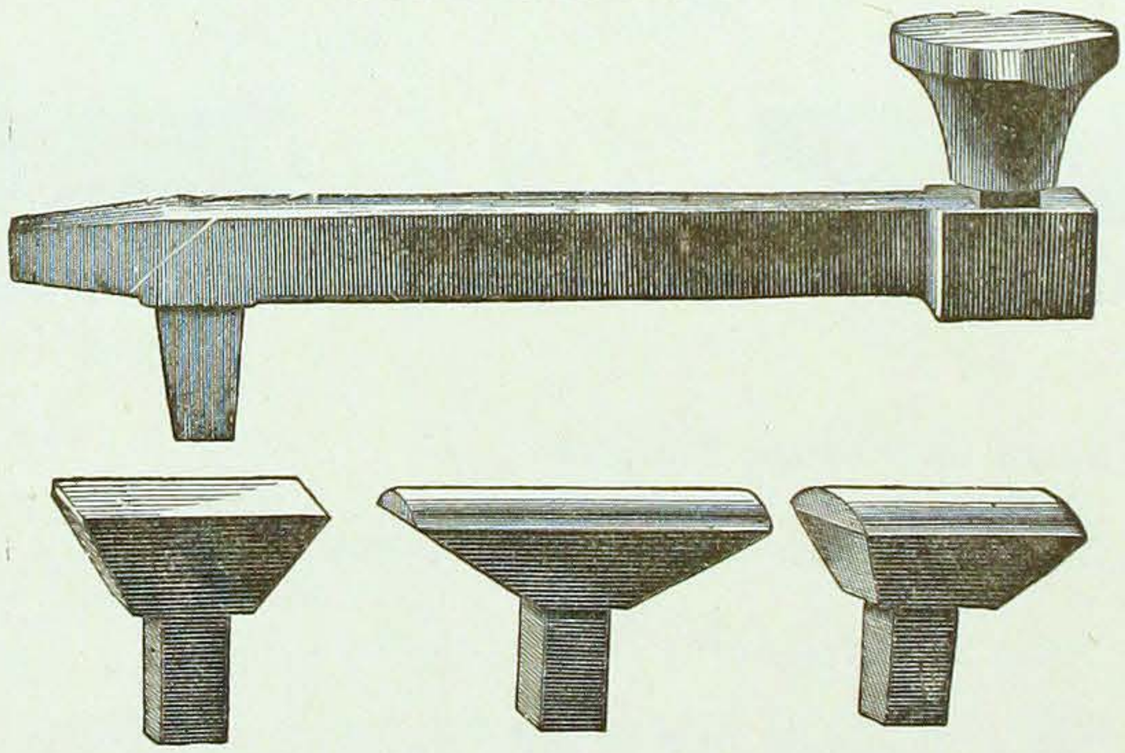
Tea-Kettle Stake, with four Steel Heads.



Hollow Mandrel Stake.



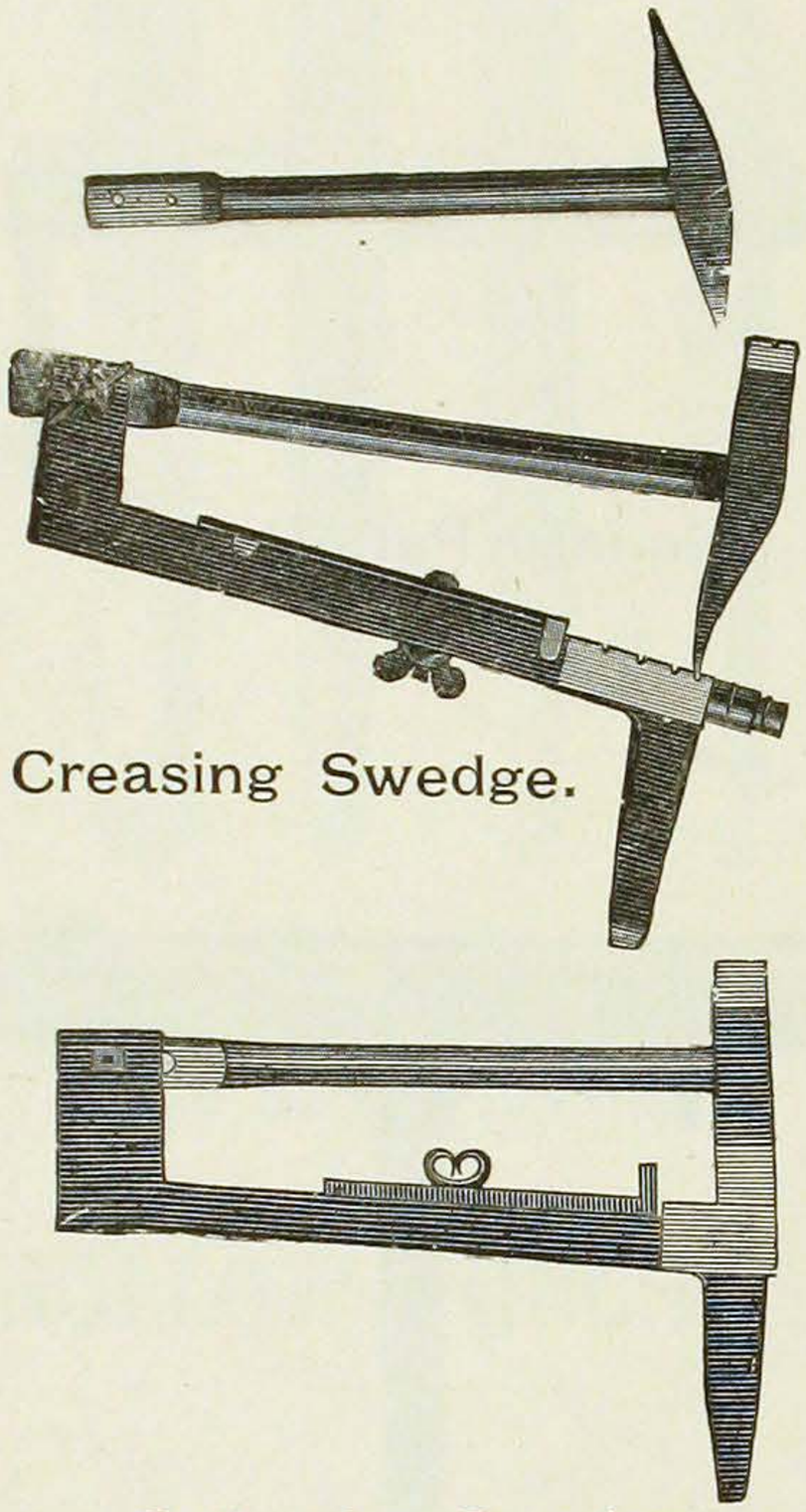
Solid Mandrel.



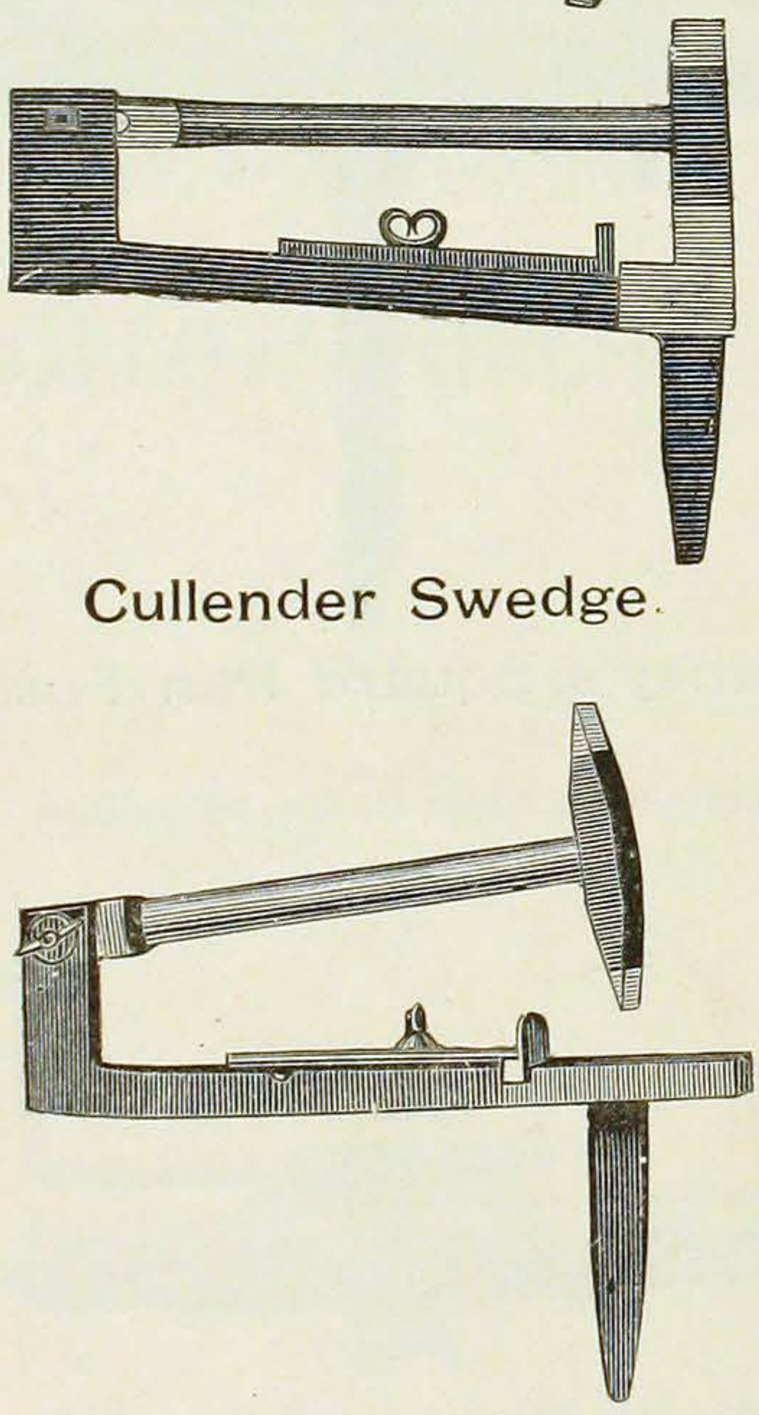
Double Seaming Stake, with Four Heads.

Tea-Kettle Stake, Wrought, with 4 Steel Heads		$15.75
Extra Steel Heads, for Tea-Kettle Stakes	each	1.75
Double Seaming, with 4 Heads		9.00
Extra Heads for Double Seaming, with 4 Heads	each	1.50
Hollow Mandrel, 3 feet 4 inches, entire length		5.50
Extra Hollow Mandrel, 4 feet entire length, round part 11¾ inches diameter, flat part 15 inches wide. Weight 300 pounds		25.00
Solid Mandrel, Extra Small, length 24 inches		2.50
Solid Mandrel, Small, length 42 inches		4.00
Solid Mandrel, Taper, length 44 inches		4.00
Solid Mandrel, Large, length 45½ inches		4.50

SWEDGES.



Creasing Swedge.

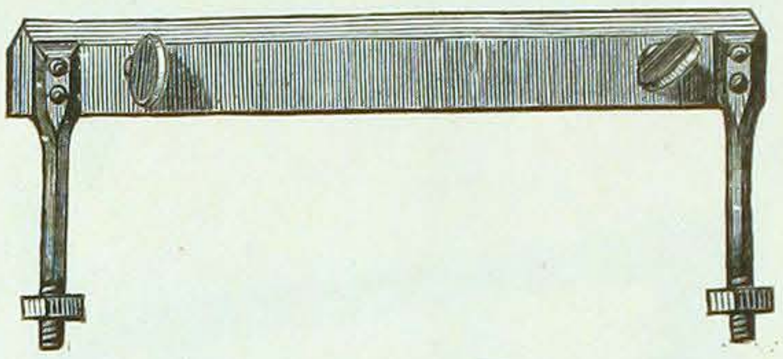


Cullender Swedge.

Square Pan Swedge.

Creasing Swedge	$5.25
Cullender Swedge	4.75
Square Pan Swedge	5.00
Elbow Swedge	5.00

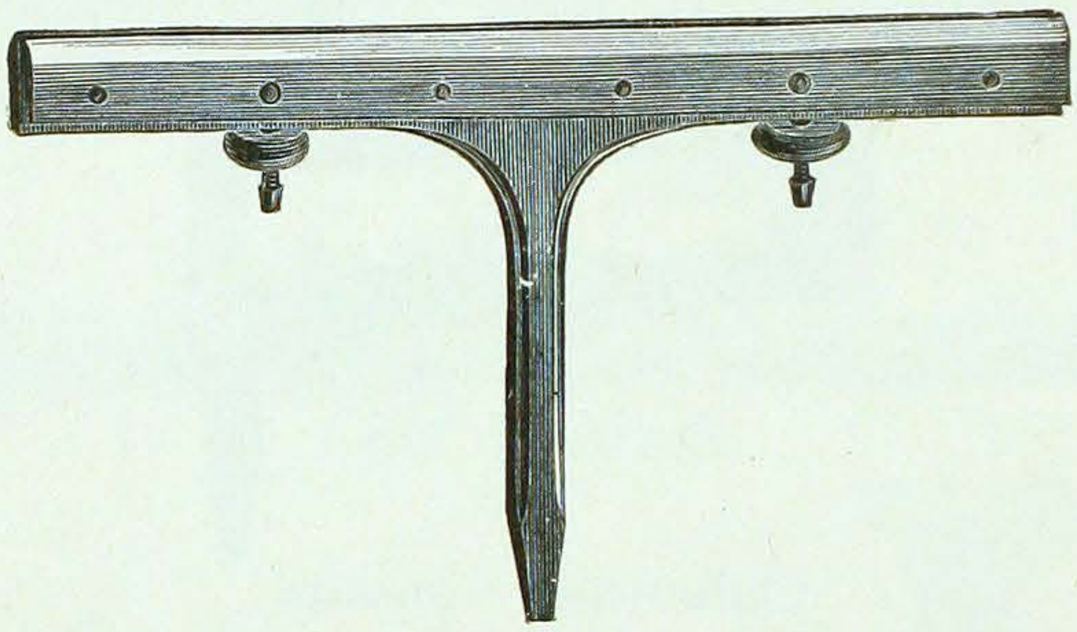
SQUARE PAN MACHINES.



Square Pan Turner.

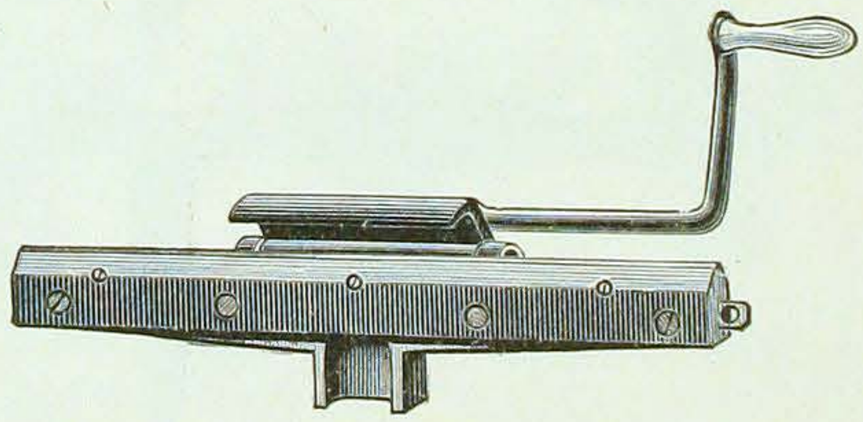
No. 1. Steel, 20 inches $2.50

No. 2. Steel, 15 inches 2.00



Whitney's Square Pan Former.

Whitney's Square Pan Former, with Steel Blade, 20 inches $2.50

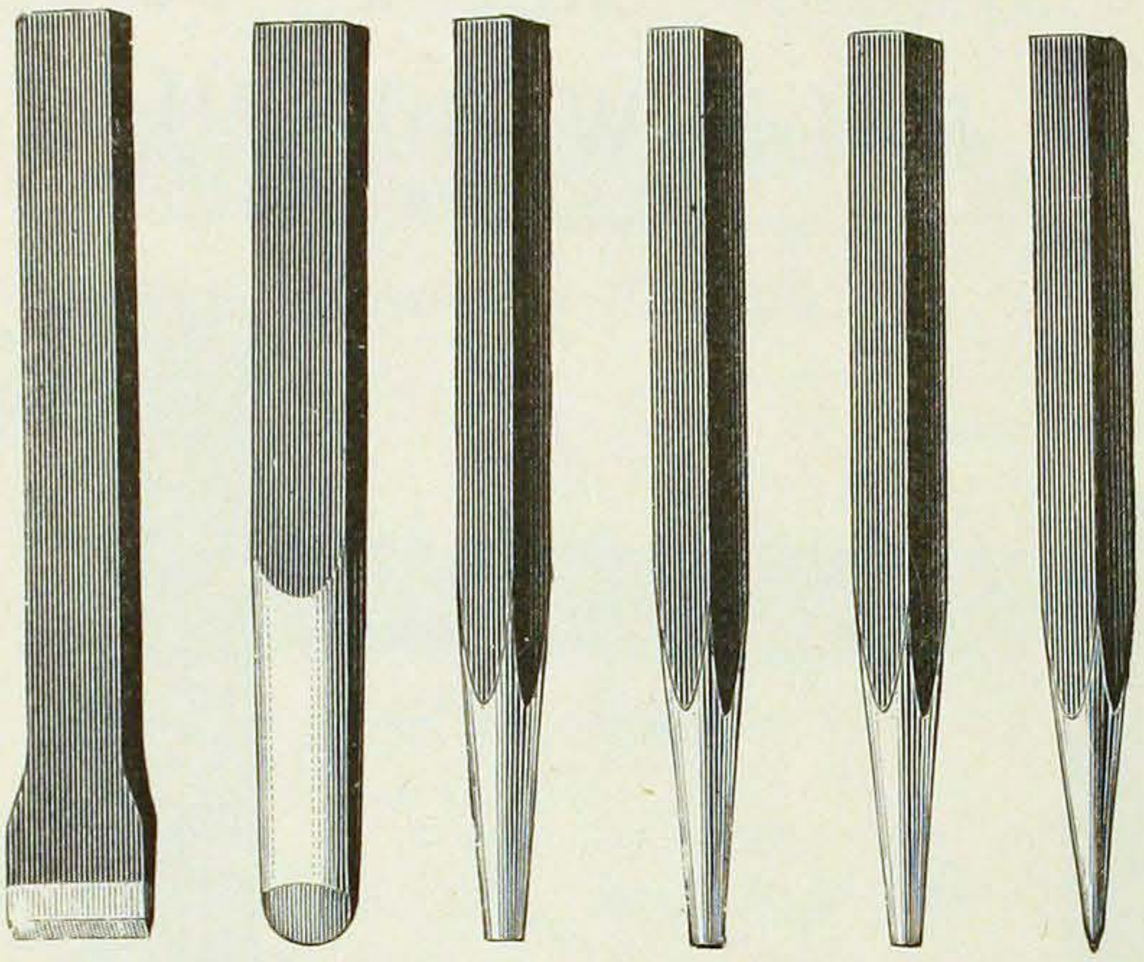


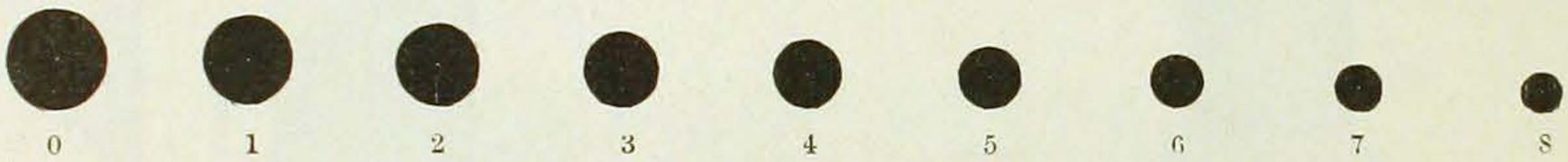
Miller's Square Pan Folder.

This Machine is constructed so as to turn the edges of different sizes of square pans, tin or iron, rendering the locks suitable for any size wire.

Miller's Square Pan Folder, Adjustable Gauge, 20 inches $5.00

SOLID PUNCHES.

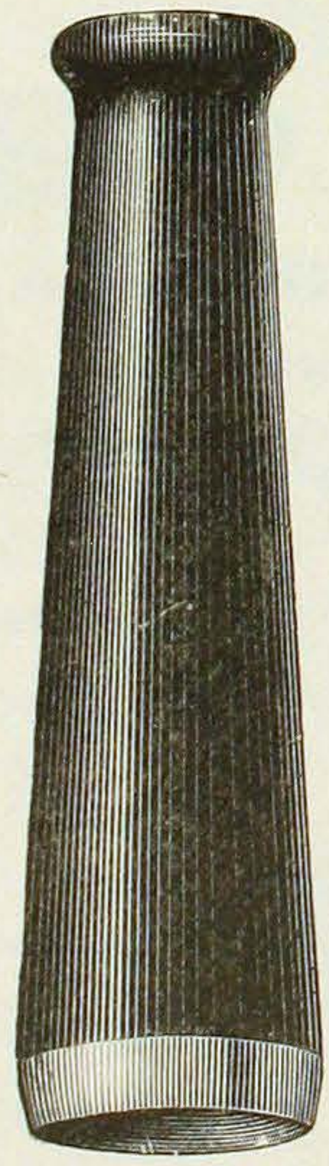




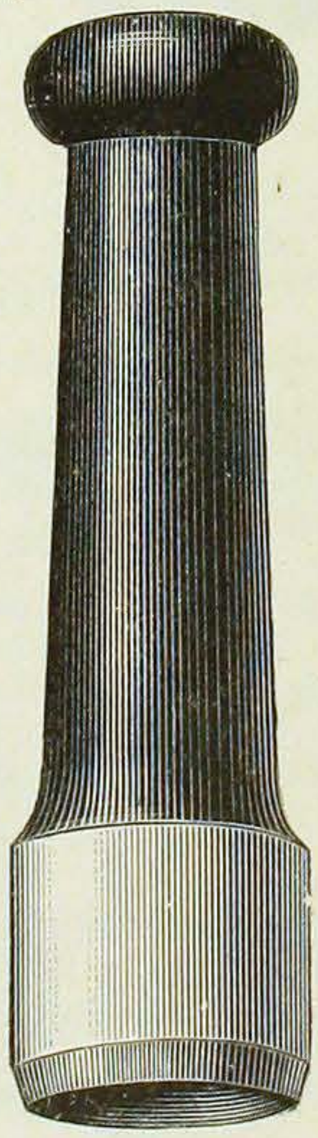
Set Solid Punches.

Set Solid Punches—4 Punches, 2 Chisels	$0.72
Square, Cast-Steel, Nos. 0, 1, 2, 3, 4, 5, 6, 7, 8, and Prick	each .12

HOLLOW PUNCHES.



Wrought Shank.

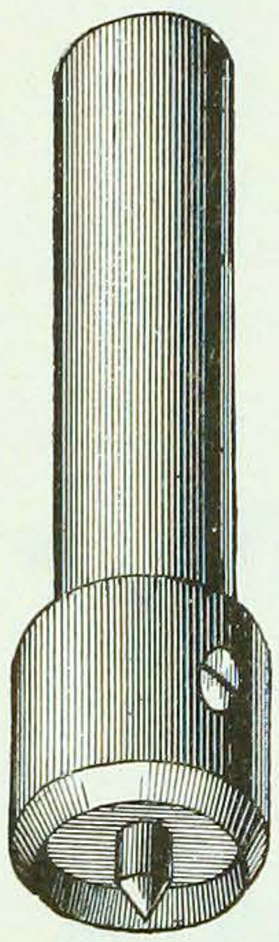


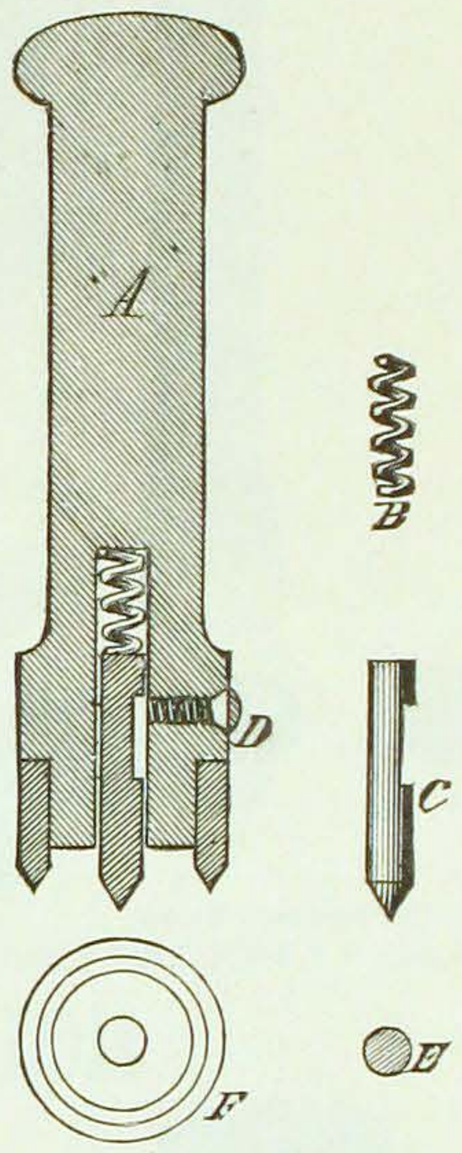
Cast Shank.

All Sizes, to and including 1¾ inch diameter, round, per inch	$1.00
All Sizes, above 1¾ inch diameter, Wrought Shank	1.25
All Sizes, above 1¾ inch diameter, Cast Shank	1.00
Oval, per inch	1.50

PATENT AUTOMATIC, OR SELF-CENTERING

HOLLOW PUNCH.





The above engravings represent an improvement in hollow punches, the need of which has been a long felt necessity. The punch is self-centering, being arranged with a central spindle projecting a little beyond the edges of the punch, as shown in above sectional view, and having a sharp central point. The spindle serves a double purpose, viz.: First, to find the center of hole to be punched, thus avoiding inaccuracy. Second, for extracting the punchings; as by this device the blanks remain on the block when the punch is raised from the work.

PRICES.

All sizes, to and including $1\frac{5}{8}$ inch diameter	per inch	$1.25
All sizes above $1\frac{5}{8}$ inch diameter, Wrought Shank . . .	per inch	1.50
Sizes $1\frac{3}{4}$, $1\frac{7}{8}$, and 2 inches, Cast Shank	per inch	1.25

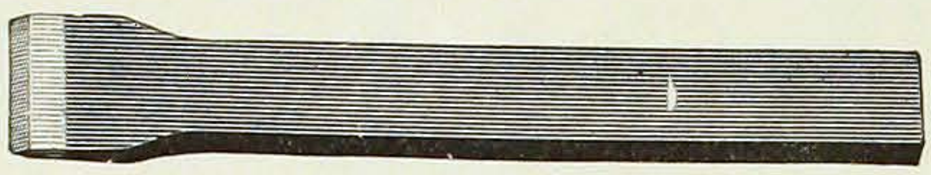
One-half inch is the smallest size made.

CAST STEEL CHISELS.



Lantern Chisels.

Lantern Chisels, common size . . . . . each $0.12

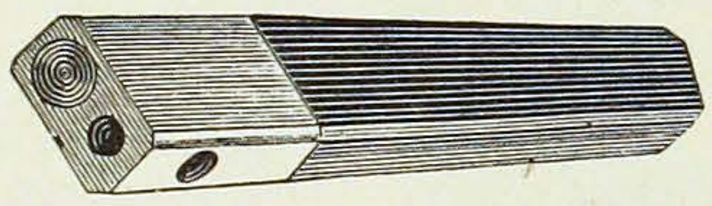


Wire Chisel.

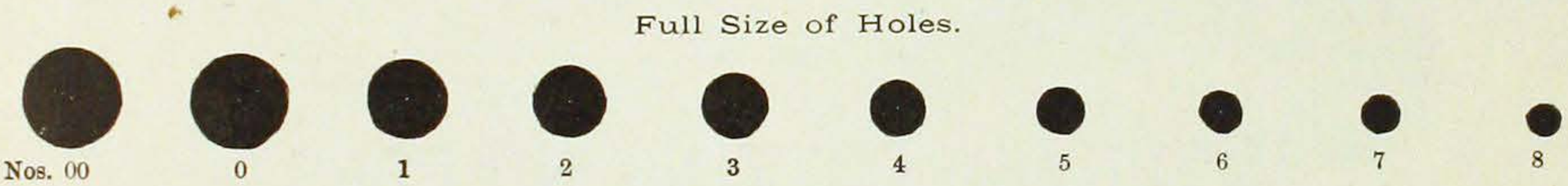
Wire,	¼,	⅜,	½,	⅝,	¾,	⅞,	1,	1⅛,	1¼,	1½,	1¾,	2 inches.
Each,	8,	9,	10,	11,	12,	13,	14,	15,	17,	20,	24,	29 cents.

Circular Chisels . . . . . per inch $0.25

RIVET SET AND HEADERS.



Full Size of Holes.

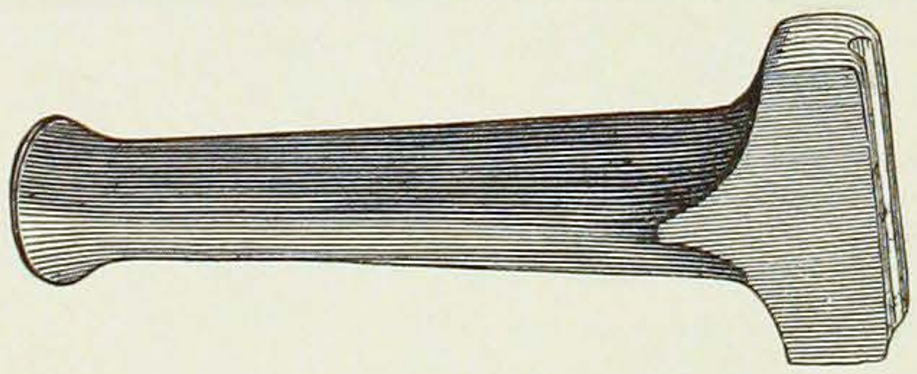


Rivet Set.

Nos.	00 and 0,	1 and 2,	3 and 4,	5 and 6,	7 and 8	Cast-Steel, extra.
Each,	75,	63,	50,	37,	32	cents.

Ornament Sets . . . . . each $0.38

GROOVING TOOLS.



Hand Groover.

Nos.	00 and 0,	1 and 2,	3 and 4,	5 and 6,	7 and 8,	Cast-Steel.
Each,	75,	63,	50,	37,	25	cents.

SCRATCH AWLS.

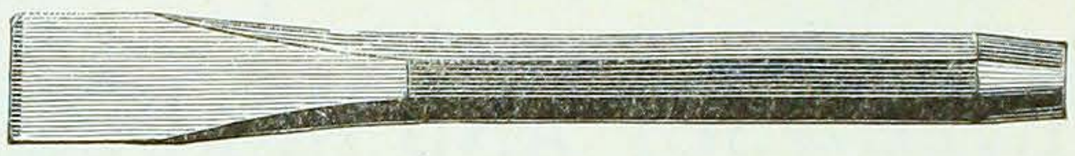


Best Cast Steel.

No. 1. Steel Scratch Awls . . . . . per dozen $1.50

In boxes of one dozen.

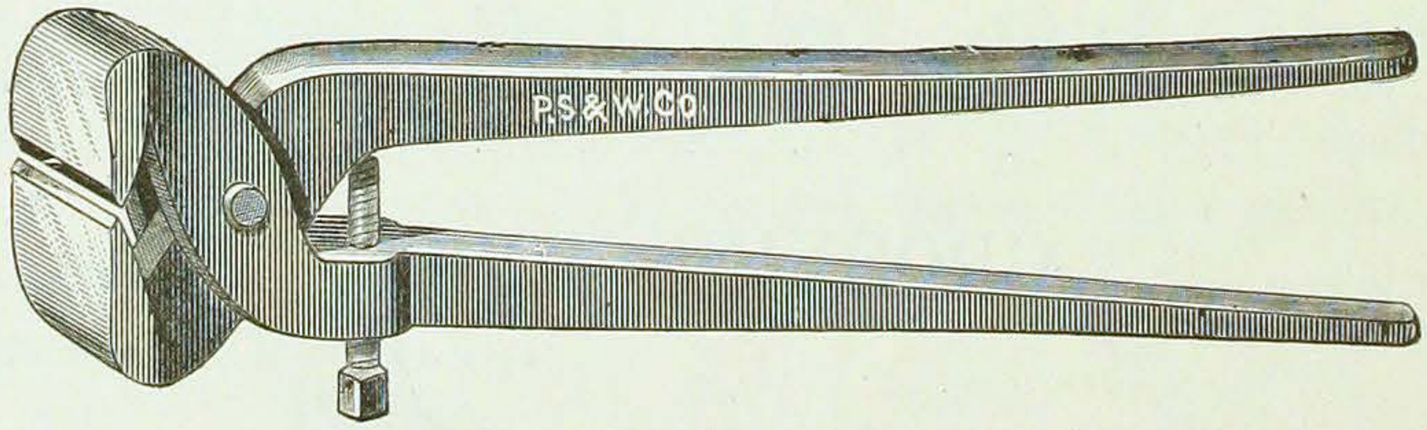
COLD CHISELS.



Octagon Cast Steel, Half Polished.

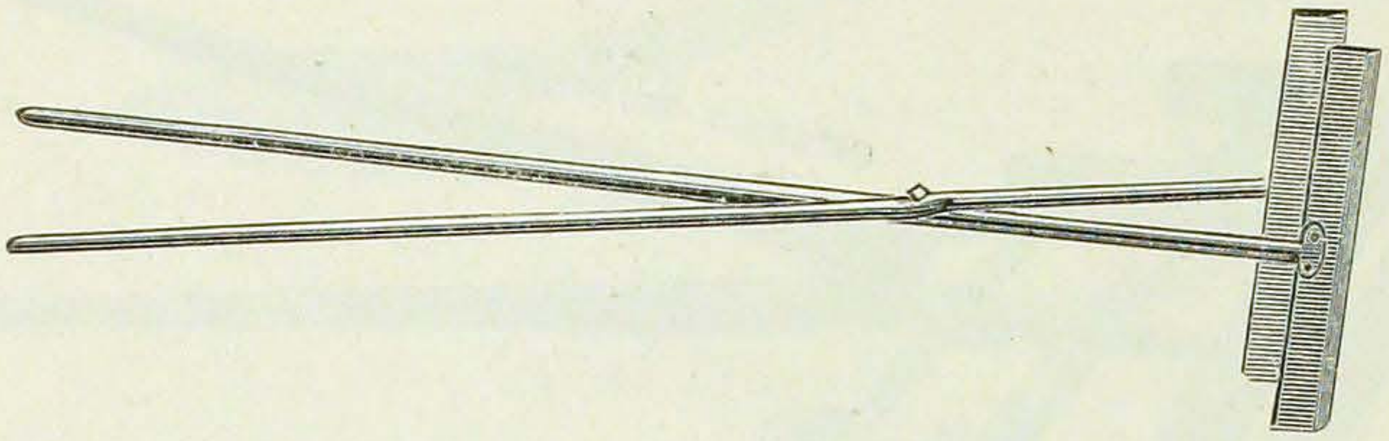
Inches	$\frac{3}{8}$,	$\frac{1}{2}$,	$\frac{5}{8}$,	$\frac{3}{4}$,	$\frac{7}{8}$,	1,
Per dozen,	$3.60,	$4.50,	$6.00,	7.50,	$10.00,	$12.80

IMPROVED CUTTING NIPPERS.

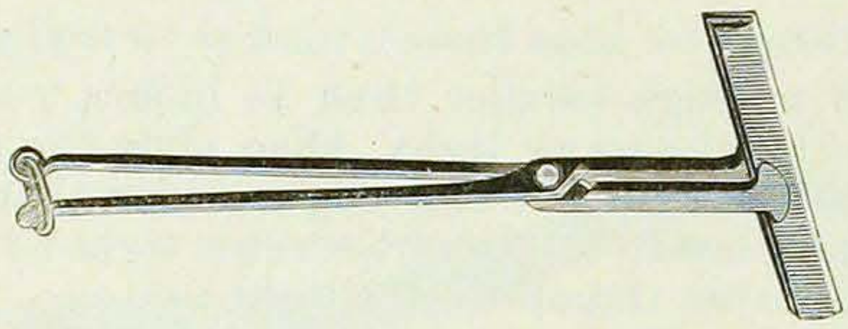


No. 1. Extra Large Size, 12 inches long . . . . . each $2.25
No. 2. Large Size, 11 inches long . . . . . each 2.00
No. 3. Common Size, 10 inches long . . . . . each 1.50
No. 4. Small Size, 9 inches long . . . . . each 1.40
No. 5. Small Size, 8 inches long . . . . . each 1.00

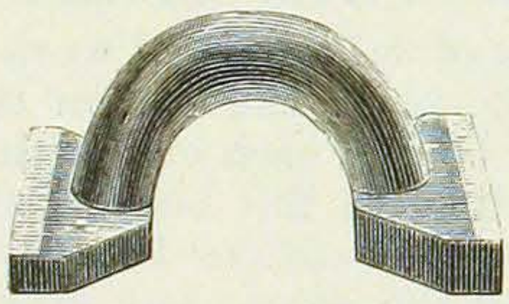
ROOFING TOOLS.



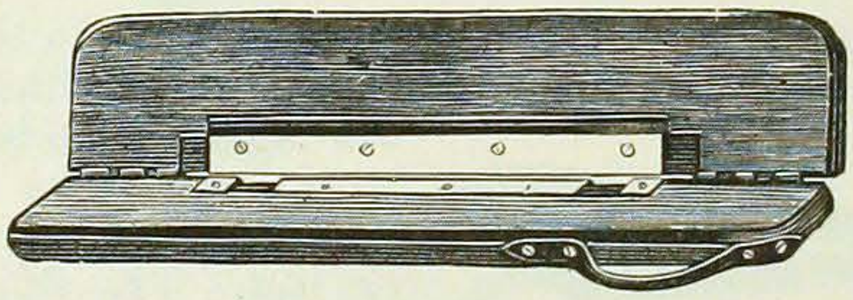
Gutter Tongs.



Clamp Tongs.



Roofing Double Seamer.

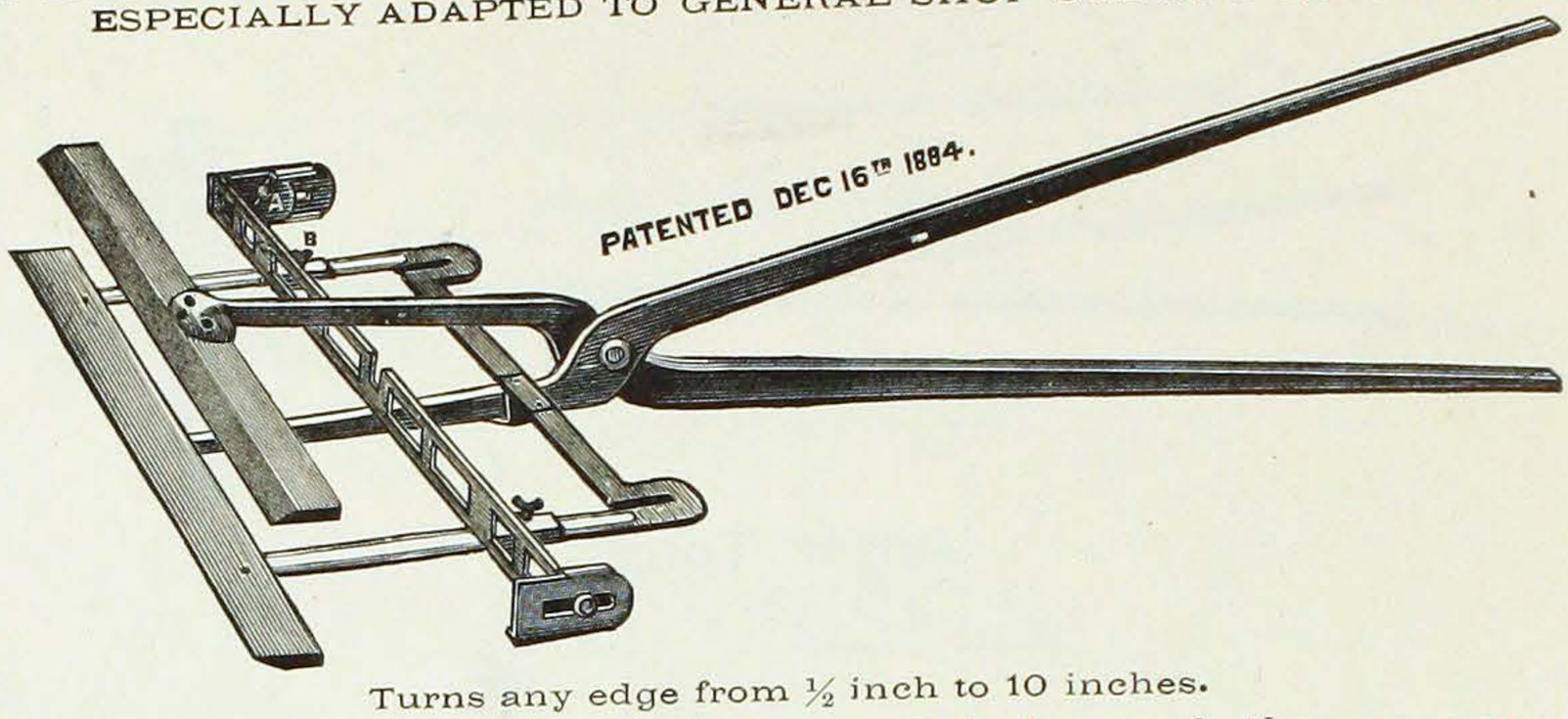


Improved Wood Roofing Folder.

Roofing Tongs, Steel, sizes, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$ inch, per set, 2 pairs	$6.00
Roofing Double Seamers, to match, per set, 2 pairs	1.75
Roofing Folder, Common, 30 inch, Wood	3.50
Roofing Folder, Common, 20 inch, Wood	2.50
Roofing Folder, Common, 14 inch, Wood	2.50
Roofing Folder, Improved, 30 inch, Wood, with Gauge	5.00
Roofing Folder, Improved, 20 inch, Wood, with Gauge	3.50
Gutter Tongs, each	5.00
Clamp Tongs, each	2.50

REESE'S PATENT ADJUSTABLE AND REMOVABLE GAUGE TONGS.

FOR EDGING AND BENDING ALL KINDS OF ORDINARY SHEET METAL AND ESPECIALLY ADAPTED TO GENERAL SHOP USE AND ROOFING.



Turns any edge from ½ inch to 10 inches.

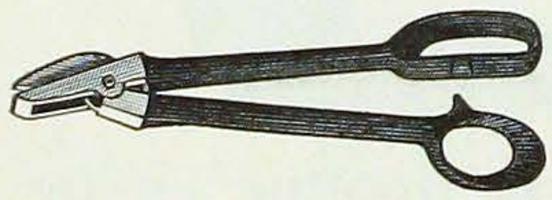
DIRECTIONS.—To turn an edge smaller than 1½ inches, push the gauge up close to the blades and fasten the thumb-screws tight; then slide the end gauge forward to the size edge required and fasten tight. When edges wider than 1½ inches are required, push the end slides back and fasten the thumb-screws tight; then move the gauge back to the required width and fasten thumb-screws tight.

Bends iron as heavy as No. 22.

Price . . . . . each $6.50

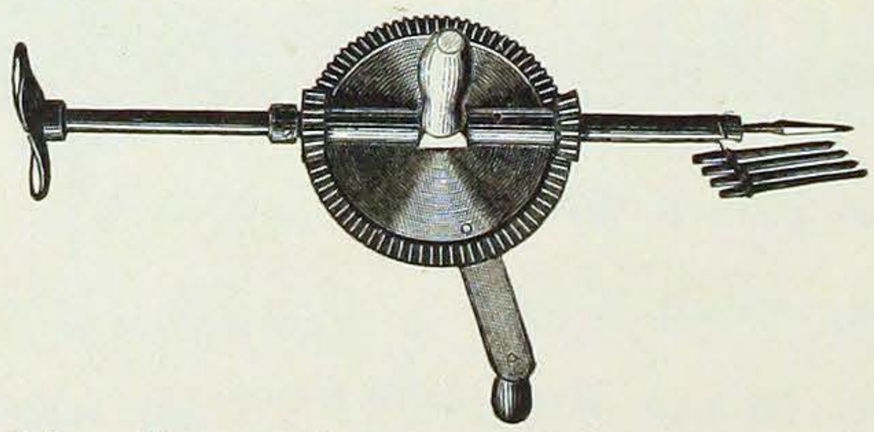
BERRIDGE'S PATENT DOUBLE-CUTTING SHEARS.

DIRECTIONS FOR USE.—To get the blade through pipe or other closed work into the proper position for cutting, open the handles full width; place the end of the upper one against the breast; take hold of each end of the pipe or work, and press the blade through full length, about one half inch beyond the seam, so as to cut (or break) the seam or last. The Shears will cut the seam, but most tinners prefer to break it off to prevent undue straining. If any trimming is required they will do it perfectly in the ordinary way of using shears. In cutting off pipe where the lengths are joined, lay the pipe on the bench or floor to insert the blade. Dip the blade in oil before using.



Price . . . . . per pair $3.00

GEARED BREAST DRILLS.

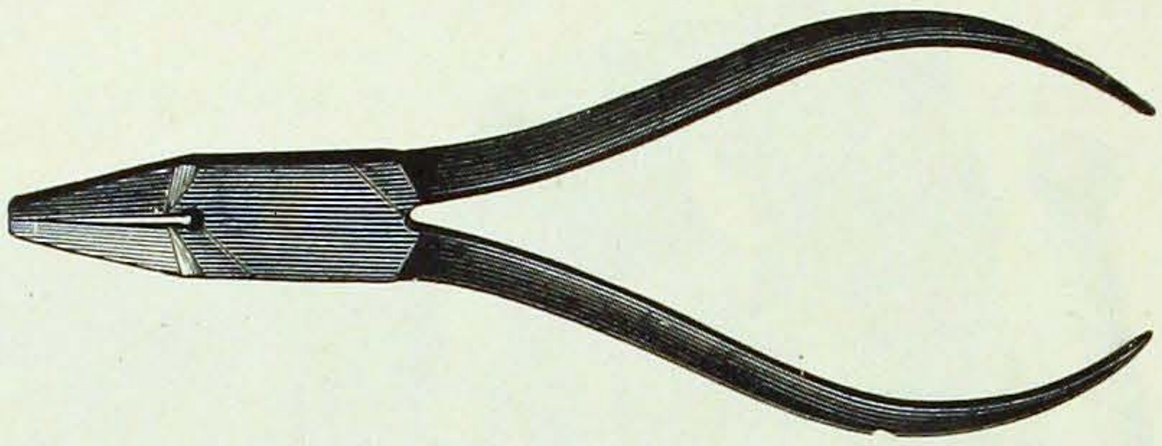


Double Geared complete with Drills.

No. 1.	Double Geared Stocks, 4 Drills, Cast-Steel	each	$4.00
No. 2.	Single Geared Stocks, 4 Drills, Cast-Steel	each	2.50
No. 3.	Single Geared Stocks, 4 Drills, Cast-Steel	each	2.25
Extra Drills		per set	1.00

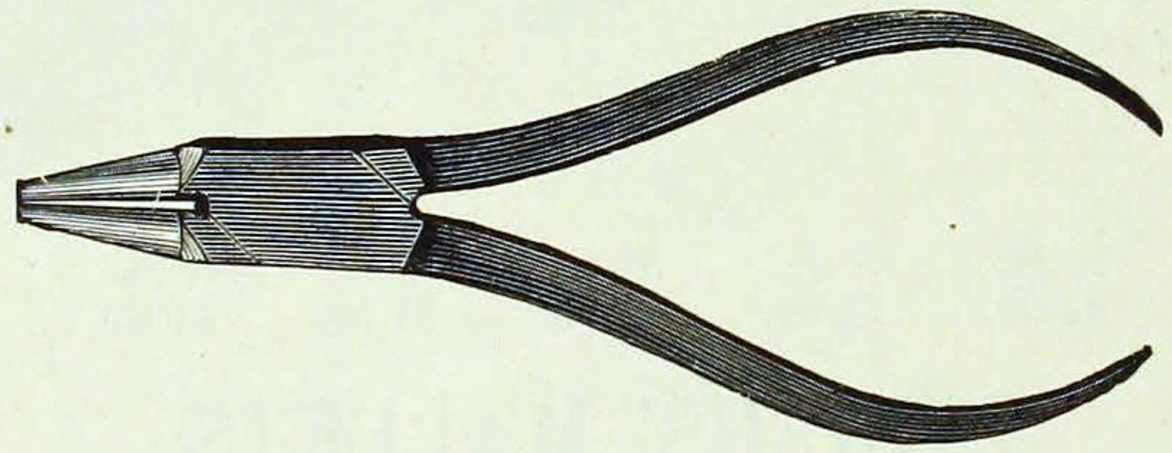
CAST STEEL PLIERS.

ALL CAST STEEL.



Flat Nose.

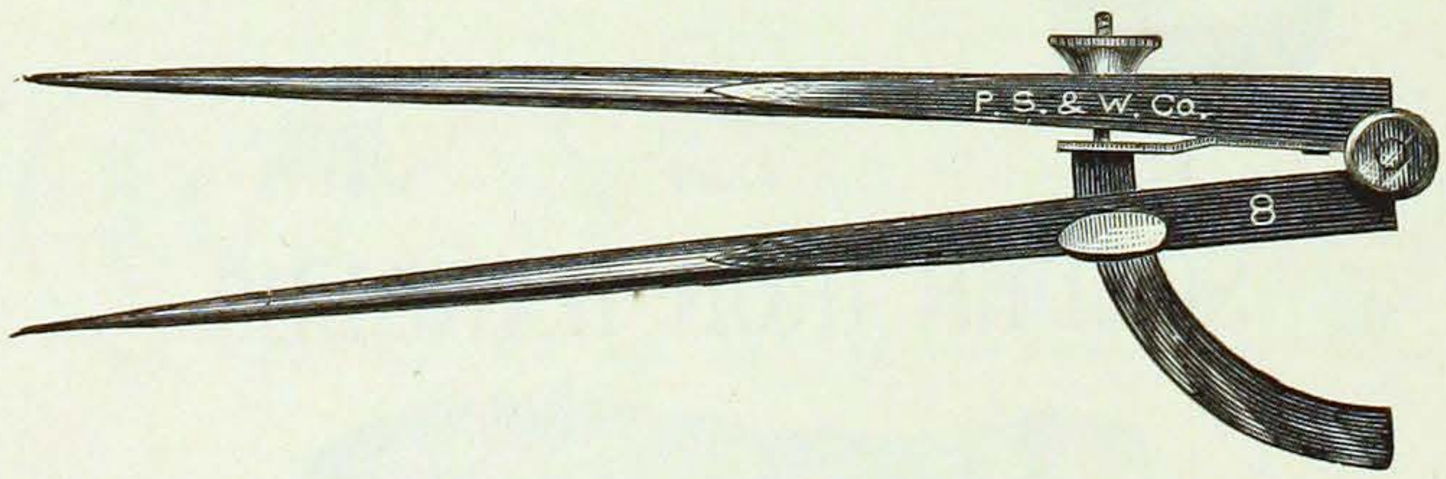
Inches	4,	4½,	5,	6,	7,	8,
Per dozen,	$4.50,	$4.50,	$5.00,	$6.00,	$8.50,	$12.50



Round Nose.

Inches,	5	6	7
Per dozen,	$5.00,	$6.00,	$8.50

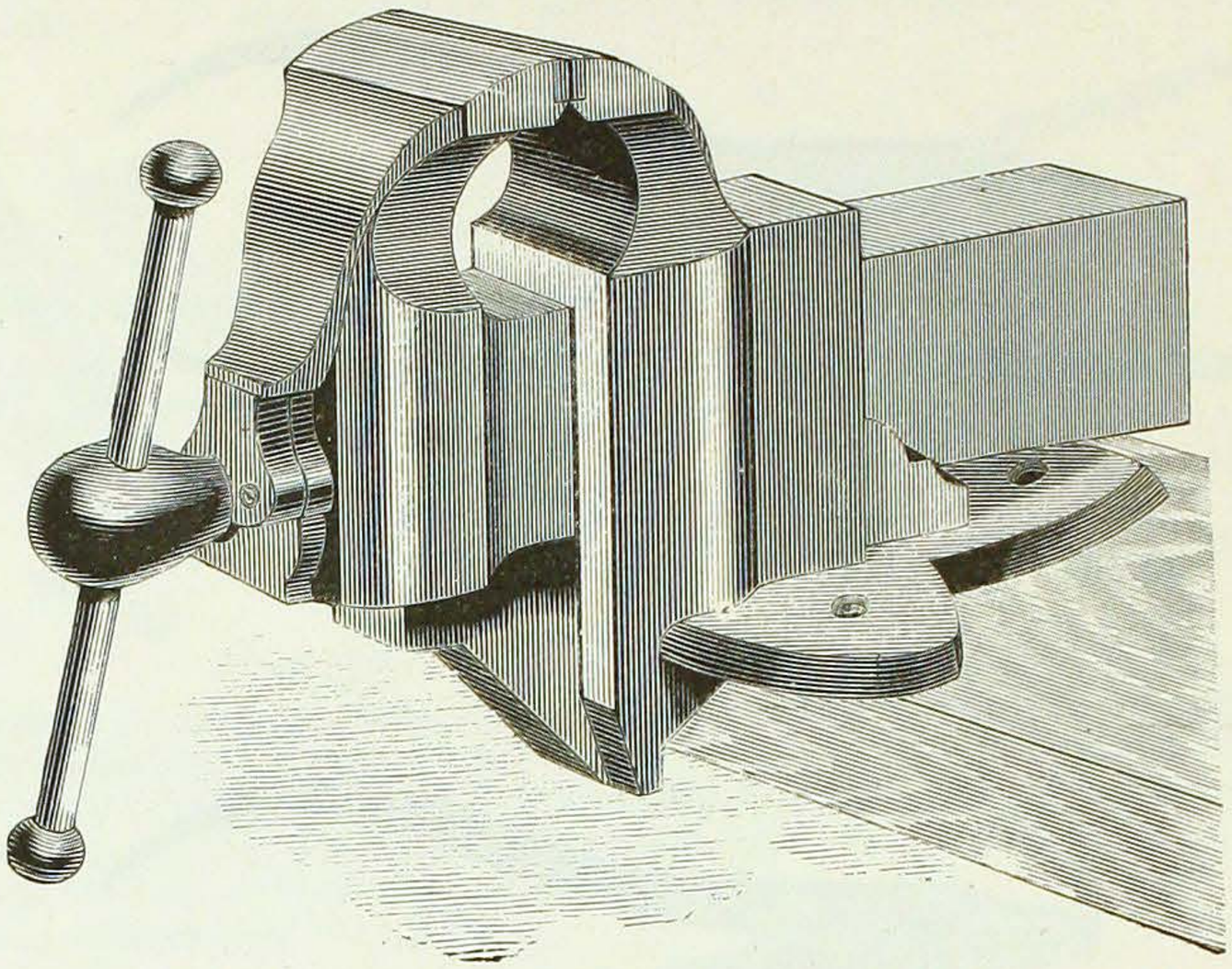
WING DIVIDERS.



Cast Steel, Polished.

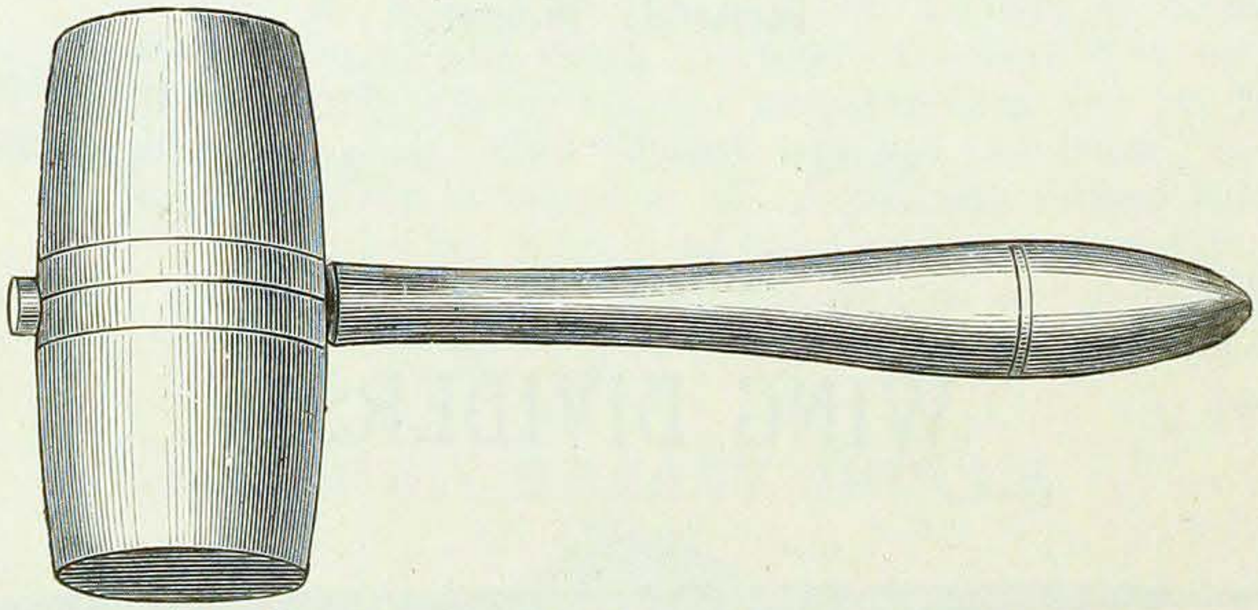
Inches,	5,	6,	7,	8,	9,	10,	12,	15,	18,	24,
Per dozen,	$5.50,	$5.50,	$6.50,	$7.50,	$9.00,	$10.00,	$12.00,	$18.00,	$25.00,	$36.00

PATENT IMPROVED PARALLEL VISE.



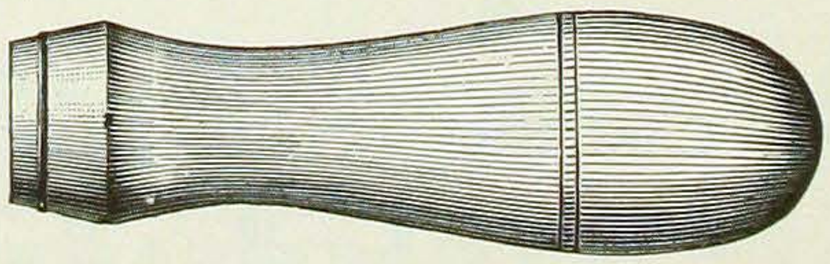
	2 in.	2½ in.	3 in.	3½ in.	4 in.	4½ in.	5 in.	6 in.
Price,	$3,00,	$4.00,	$5.00,	$5.75,	$7.50,	$9.50,	$11.00,	$16.00

TINNERS' MALLETS.



	Small.	Medium.	Large.	Assorted.
Per dozen	$1.25	$1.50	$1.75	$1.50

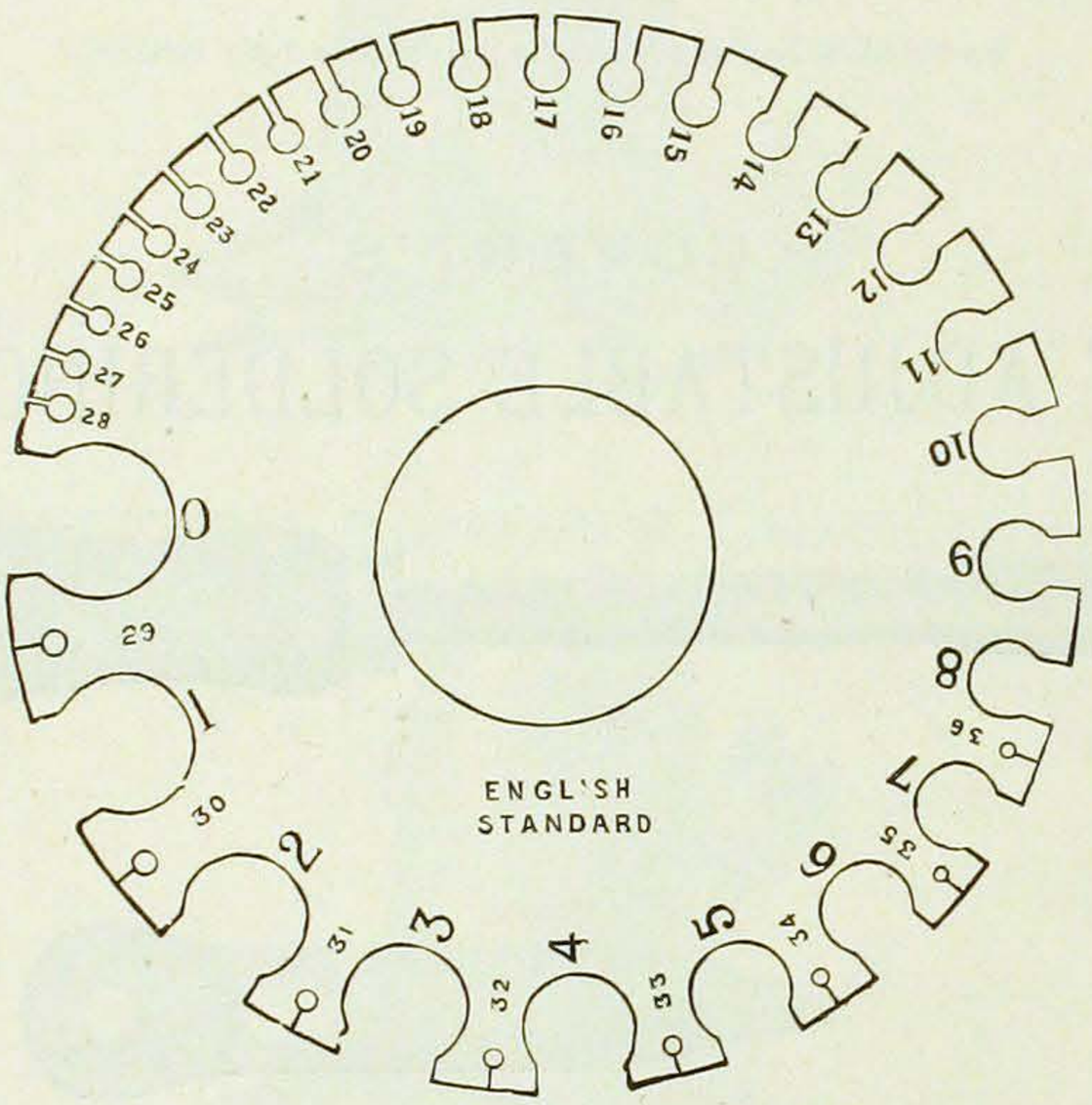
SOLDER IRON HANDLES.



Soldering Copper Handles . . . . . per dozen $0.40

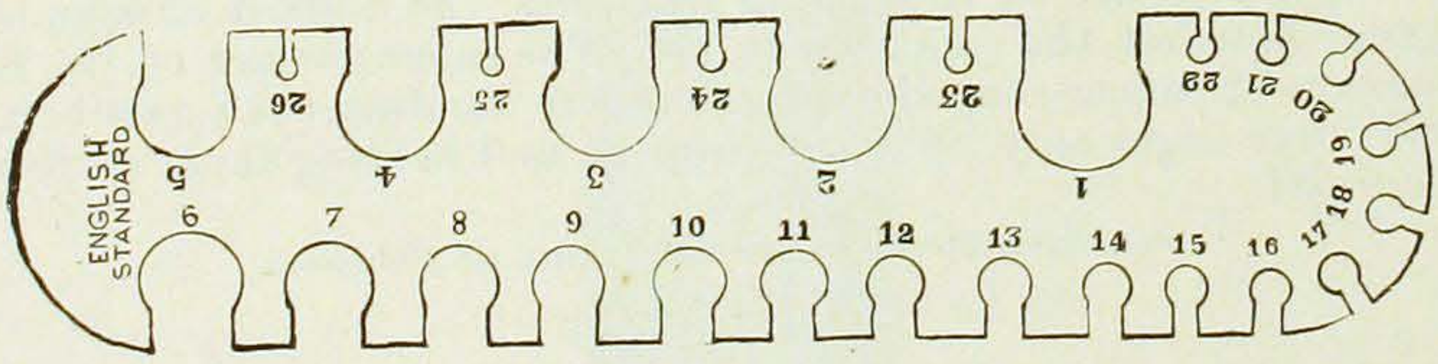
WIRE GAUGES.

ENGLISH STANDARD CAST STEEL.



Round.

No. 1.	Large, Round, Nos. 0 to 36	per dozen	$24.00
No. 2.	Small, Round, Nos. 6 to 36	per dozen	15.00



Oblong.

No. 3.	Oblong, Large, Nos. 0 to 36	per dozen	$24.00
No. 4.	Oblong, Small, Nos. 1 to 26	per dozen	17.00

SOLDER IRONS, RIVETED HANDLE.



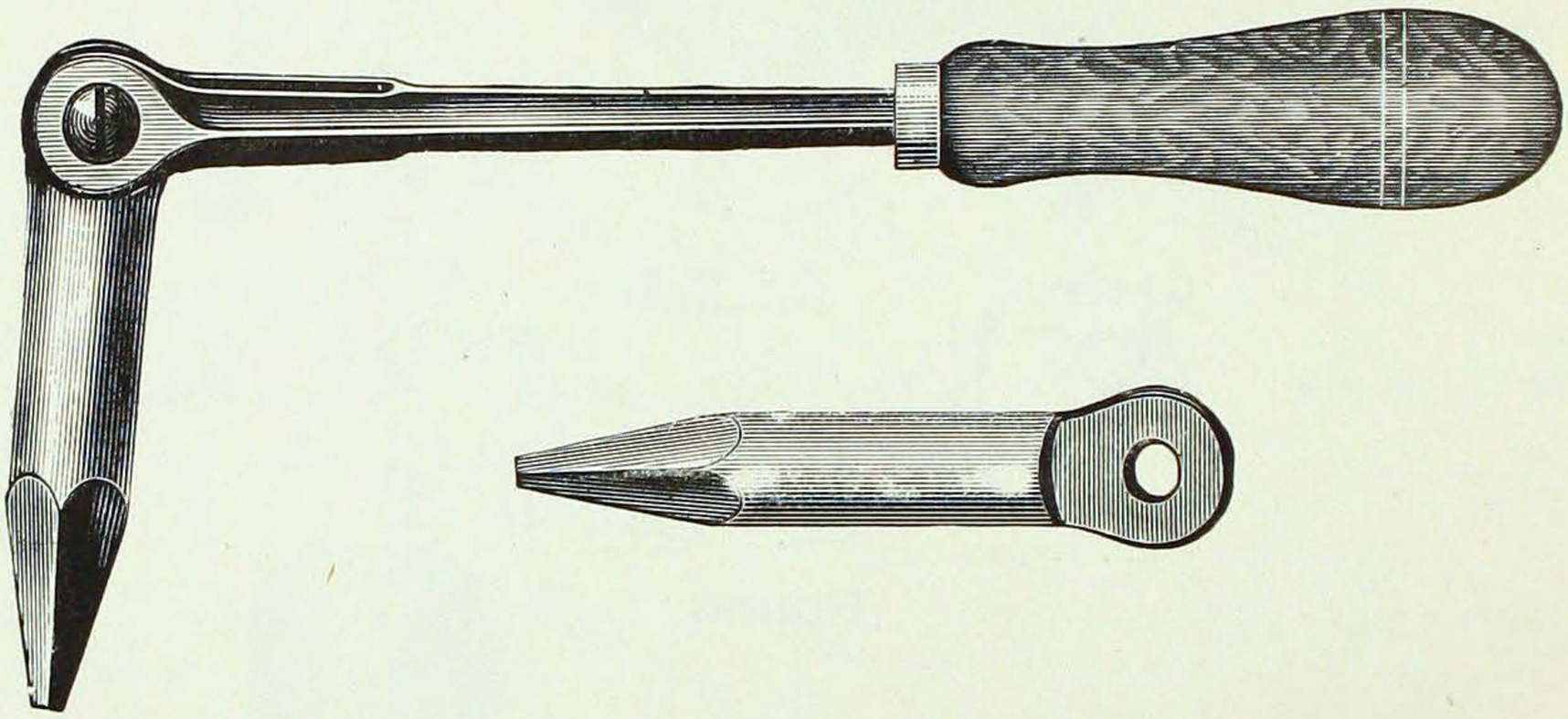
RIVETED TINNERS.

Weight each, 8, 12, 16, 20, 24, 28, 32, 40, 48, 64, 80 ounces.
Price each

Special sizes and kinds furnished to order.

COVERT'S

PATENT ADJUSTABLE SOLDERING IRONS.



As is seen in the accompanying cuts the copper point is pivoted on the handle, which allows it to be readily adjusted to any angle, thus avoiding the trouble of heating and bending the handle, so often necessary with the old style in difficult jobs of soldering and plumbing. If the copper swings too freely by reason of wear or otherwise, it is easily remedied by turning up the screw-bolt. In changing the position of the copper it is not necessary to loosen the screw-bolt, as the handle and copper are so constructed relatively that a proper pressure on the copper will work the desired change of position, it being immaterial how hot the copper may be. The inner surface of the forks are provided with concave or saucer-shaped depressions surrounding the screw-bolt, thus giving it a grip at the outer edges only, upon the coppers, and holding them perfectly secure in any position desired.

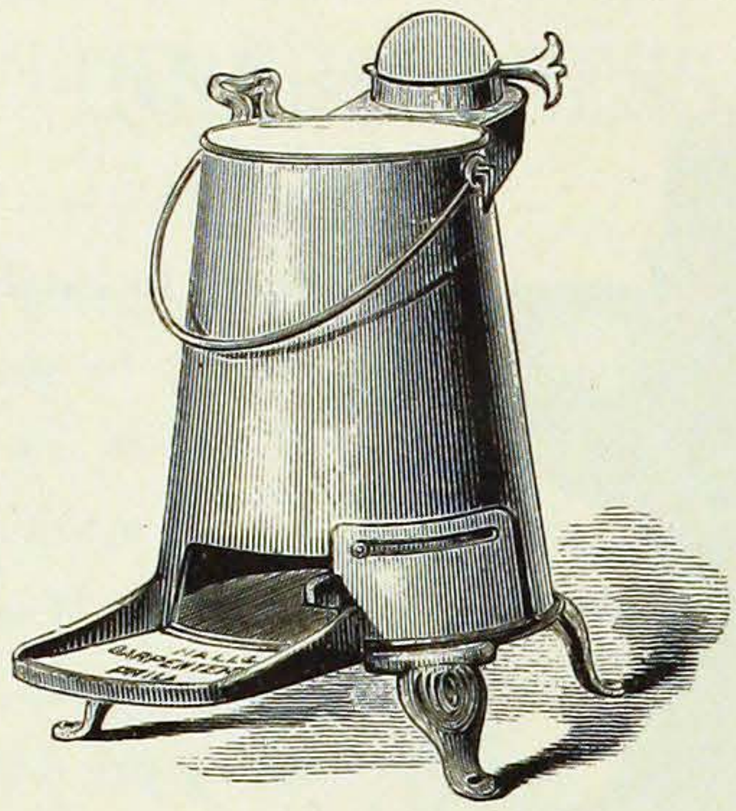
We furnish to order all styles of Coppers.

PRICE LIST.

Size.	Each.
$\frac{3}{4}$ in. diameter	$1.00
$\frac{7}{8}$ in. diameter	1.15
1 in. diameter	1.40
$1\frac{1}{8}$ in. diameter	1.65
$1\frac{1}{4}$ in. diameter	2.00

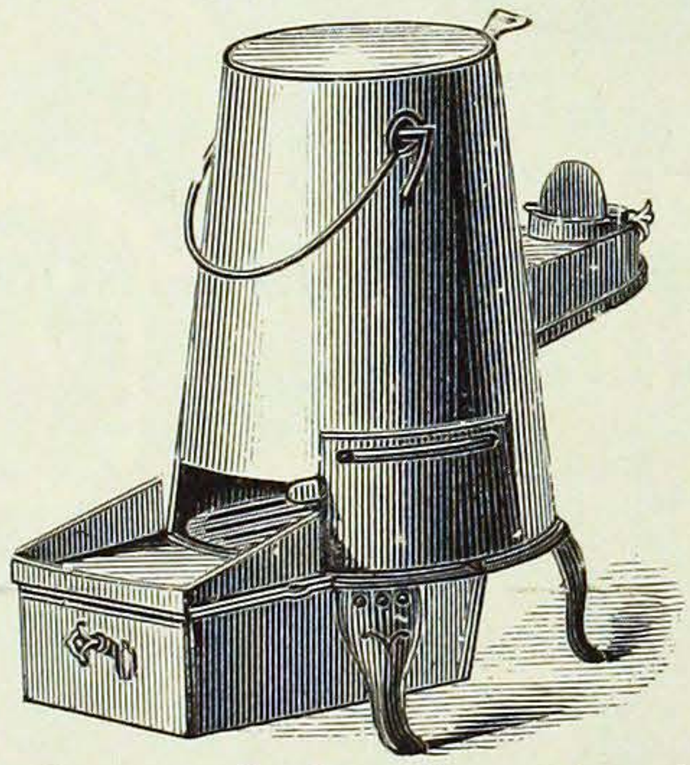
Discount.....

OUR OLD STYLE TINMAN'S CHARCOAL FURNACE



Price $1.50

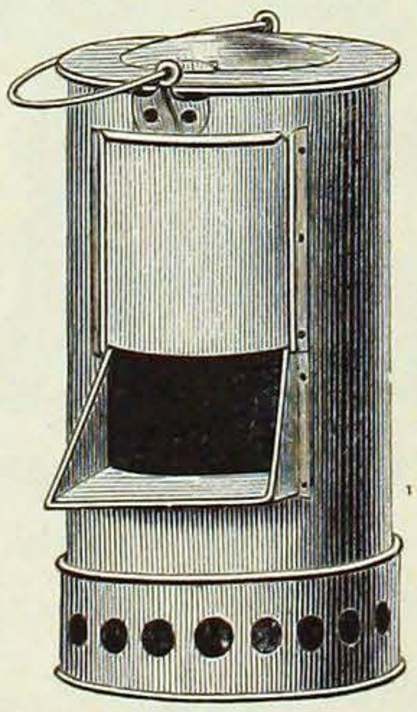
OUR NEW PATTERN TINMAN'S CHARCOAL FURNACE.



This Pot has a pan beneath to catch the ashes. As a low price, economical Pot, for tinners' use, it is probably the best that has yet been offered.

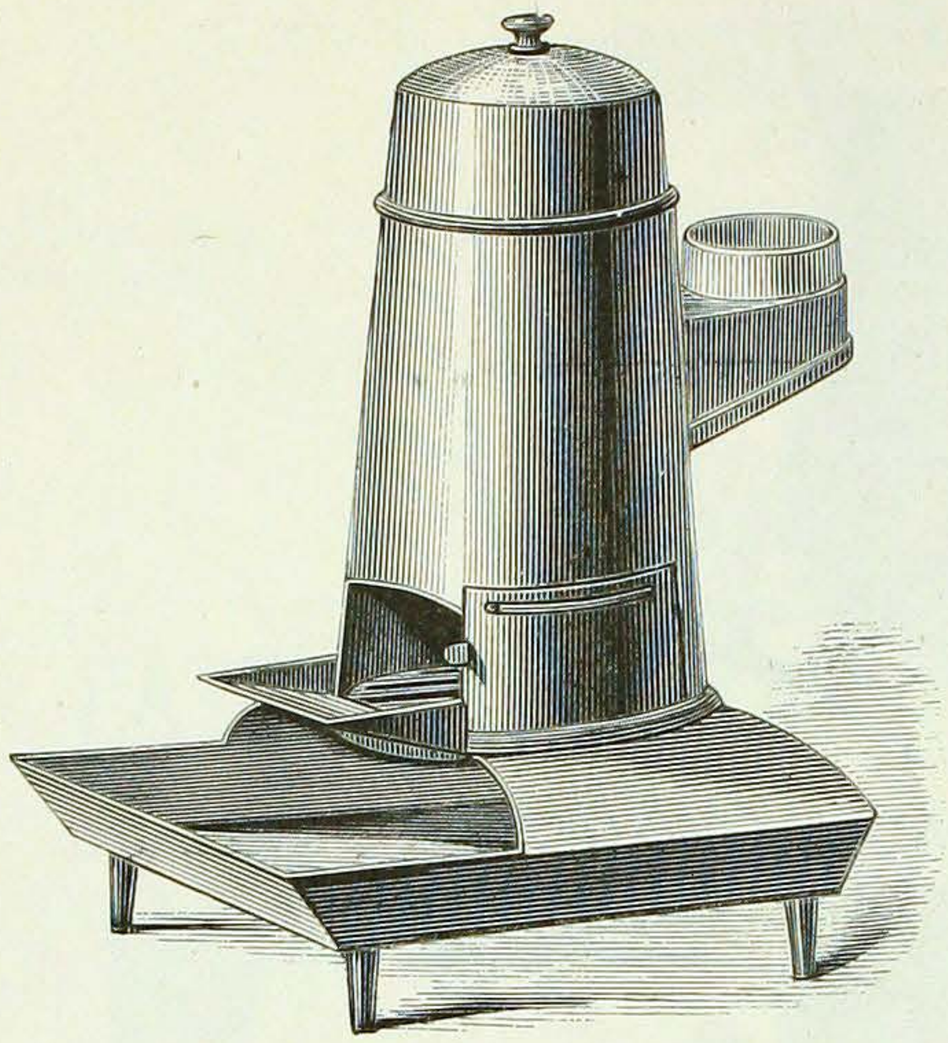
Price $2.00

SHEET-IRON FIRE POT.



Price $1.50

THE CAN-MAKER'S FIRE POT.

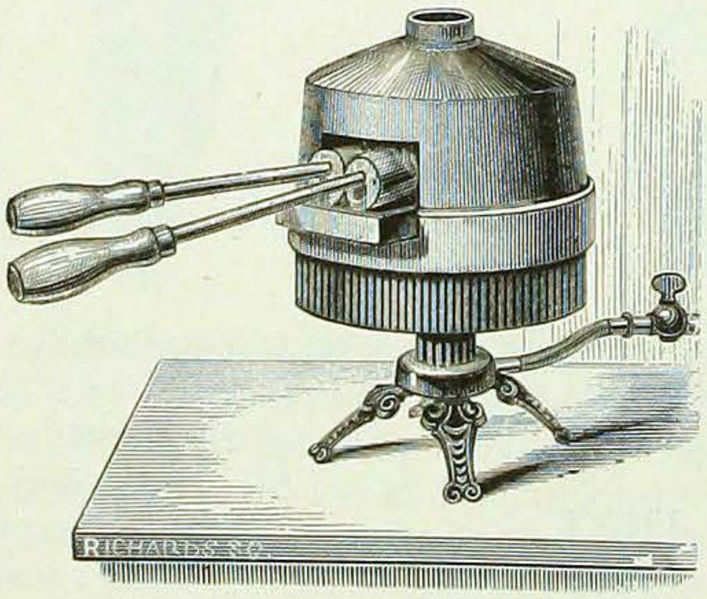


This is a large Pot, having a pan beneath to catch the ashes, and for holding water; by this arrangement the danger of fire is lessened and the workman is not so much annoyed by the heat from the pot. It is especially adapted for can-makers' use, or any work requiring a strong fire, and is the best yet made for that purpose.

Price $3.50

RETORT GAS SOLDERING-IRON FURNACE.

WITH NEW FIRE-CLAY LINING.

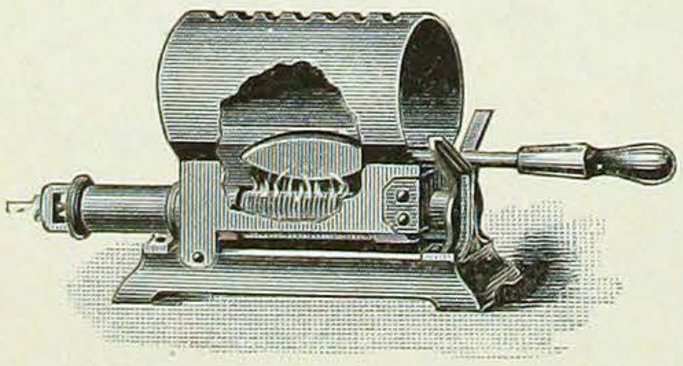


It will thoroughly heat two two-pound irons in four minutes, using at the rate of ten feet of gas per hour.

Price of Furnace for heating 2 Irons . $3.50
Price of Furnace for heating 4 Irons . 5.00

THE EXCELSIOR GAS FURNACE

FOR HEATING SOLDERING BITS FOR TINNERS, PLUMBERS, ELECTROTYPERS, Etc.



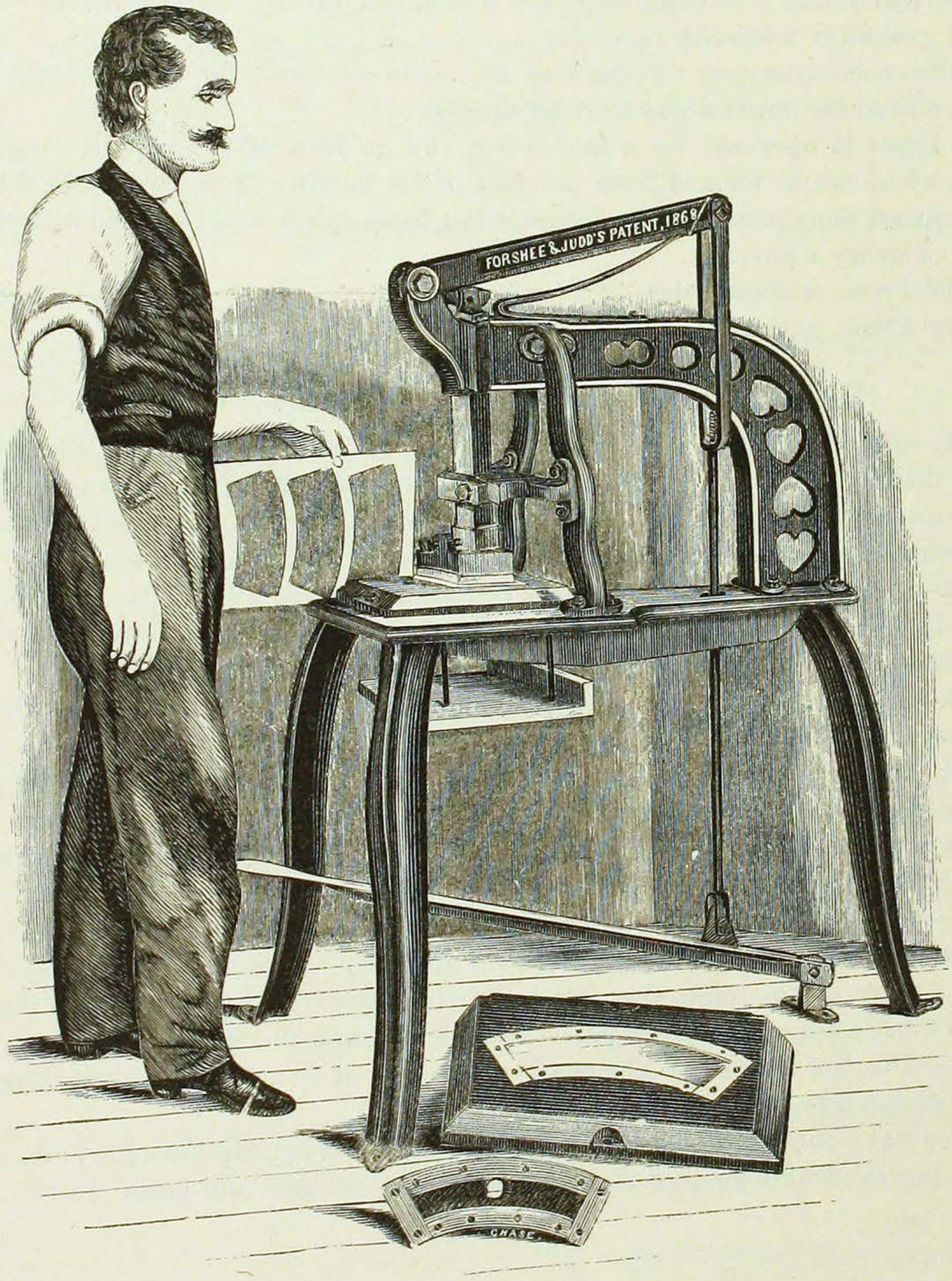
It will heat a three-pound copper in three minutes, and the consumption of gas in ordinary use does not exceed five feet per hour.

It will operate well with coal gas, water gas, or with the "air gas" produced from gasoline in gas machines.

Price $1.75

TINNERS' PRESS.

FORSHEE & JUDD'S PATENT.



For cutting the sides of flaring tinware, such as Pans, Pails, Basins, Coffee and Teapots, Dippers, etc.

TINNERS' PRESS.

The cut on page 107 represents a machine designed to relieve the tinman of the most laborious work he has to perform. The pieces are cut with exactness, and are notched ready for the folder, obviating the necessity of marking and locking. The cutting is done by dies accurately made, of best refined cast-steel, finely tempered. These dies will retain a cutting edge for years, but are so constructed as to be taken apart and ground if necessity requires.

The dies accompanying the Machine are made especially for flaring work, but others can be furnished for cutting any desired shapes.

This Press is operated by a foot lever, and an idea of the rapidity with which it may be worked can be formed from the fact of its cutting from twelve to fifteen dozen six or ten quart pans per hour. It occupies but little space, and its price makes it within the reach of every tinner.

Tinners' Press, without Dies	$130.00
Tinners' Press, with four Dies, Nos. 1, 2, 3, 4	225.00

Description of Dies for Tinners' Presses.

No. 1.—Die No. 1 cuts three pieces the short way of 10 x 14 tin, which make the following dishes: Two pieces make the side to one quart pail; two pieces make the side to one-quart dipper; three pieces make the side to two quart basin; three pieces make the side to a wash bowl; three pieces make the side to a milk strainer.

No. 2.—Die No. 2 cuts three pieces the short way of 10 x 14 tin, which make the following dishes: Three pieces make the side of a four-quart pan; four pieces make the side of a six-quart pan; five pieces make the side of a ten-quart pan.

No. 3.—Die No. 3 cuts two pieces the short way of 10 x 14 tin. This Die is made without the notch for the wire; by so doing it makes two more dishes. We can make with notch for wire to order. Two pieces make the sides to two quart teapots; two pieces make the sides to two quart coffee-pots; three pieces make the sides to five quart pails; four pieces make the sides to twelve quart dish pan; five pieces make the sides to fourteen quart dish-pan; six pieces make the sides to twenty quart dish-pan.

No. 4.—Die No. 4 cuts one piece the long way of 10 x 14 tin: Two and a half pieces make the side to ten quart strainer pail; two and half pieces make the side to ten quart water-pail; three pieces make the side to fourteen quart water-pail; three pieces make the side to fourteen quart strainer-pail; five pieces make the side to very large dish-pan.

No. 5.—Die No. 5 cuts two pieces the short way of 10 x 14 tin, making the breast or top to one gallon oil-cans.

We also have patterns for dies for cutting sixteen quart sap-buckets, pails, etc. Two and a half pieces of this pattern make twelve quart buckets and pails.

No. 1. Die	$20.00
No. 2. Die	20.00
No. 3. Die	25.00
No. 4. Die	30.00
No. 5. Die	35.00

SUNDRY MACHINES.

Dipper Handle Machines $4.00

Spaulding's Patent Tube Former, Power. Same Machine will form Tubes of different diameters from ⅝ to 1¼ inches, by using a wooden roller of size required. The Machine has three rolls 75.00

Shepherd & Stow's Wiring Machine, for Tin, with Stand 16.00

No. 0. Wiring, for Brass Kettles and other heavy work, Hand Power . . 40.00

With Standard 41.50

No. 0. Large Turning, for Brass Kettles and other heavy work, Hand Power . 40.00

With Standard 41.50

Square Box and Square Pipe Folding Machine, 20 inches, worked by foot, accurate and expeditious in its operation 30.00

Flanging Machine, for Burring inside of Rims 18.00

No. 1. Contracting, for connecting Stove-Pipe 20.00

With Standard 20.75

No. 2. Contracting, for connecting Stove-Pipe 15.00

With Standard 15.75

Elbow, for Stove-Pipe 12.00

With Standard 12.75

Pepper-Box Machine, or Extra Small Burr . , ... 7.75

With Standard 8.50

Extra Small Turning Machine 11.25

With Standard 12.00

Bigelow's Patent Sheet-Iron Grooving Machine, 30 inch, complete, with Standards. 40.00

Bigelow's Patent Sheet-Iron Grooving Machine, 36 inch, complete, with Standards. 50.00

In addition to the above, we furnish to order a great variety of odd machines for forming and bending sheet metal to any required size or shape, and furnish such machines to our customers, when requested, on *the most reasonable terms.*

MACHINE PARTS.

We give below prices for odd parts of Machines which we are frequently asked to furnish.

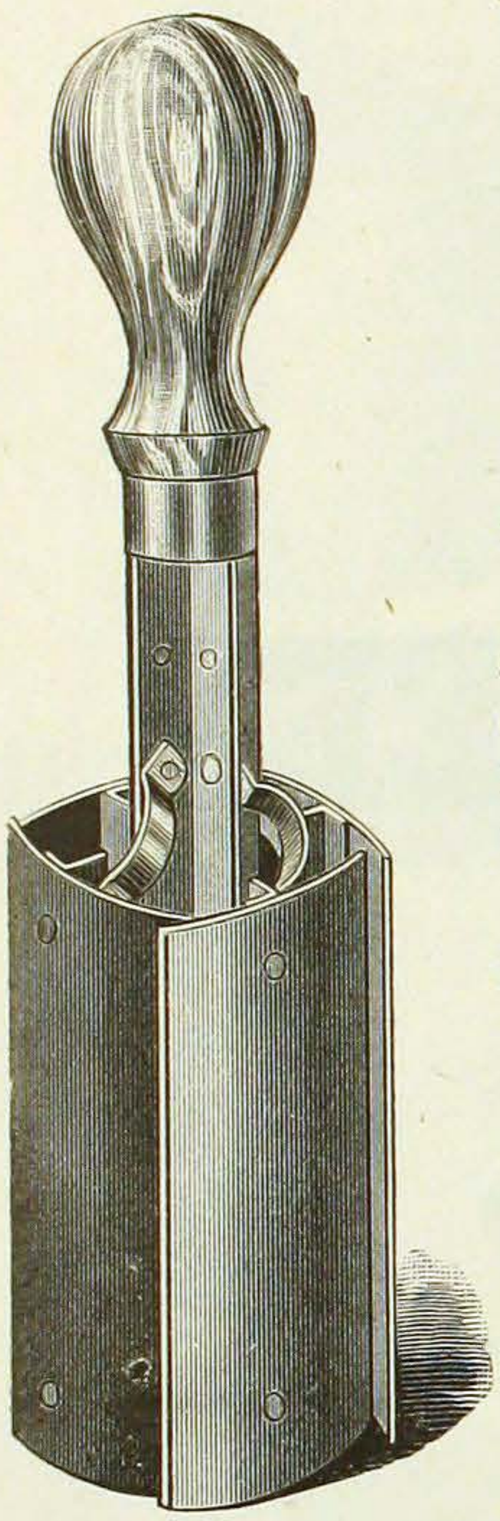
Please bear in mind that Stow's Encased Machines are the only ones to which we can furnish duplicate parts, and should be ordered by the letters and figures in our catalogue.

We do, however, sometimes (but always at the risk of the purchaser) undertake to supply parts to other machines, when the old part to replace the one for which a new part is wanted is sent us to work by.

In case of ordering new cog wheels for forming machines, the diameter of the wheel and hole should be given, and the length or thickness of the wheel measured through the hole or centre.

Set of (4) Thumb-Screws for Stove-Pipe Former		$2.00
Gear—or Cogs for Stove-Pipe Former	per pair	.50
Boxes for Stove-Pipe Former	per set	1.00
Crank for Stove-Pipe Former		.50
Yoke for Moore's Double Seamer		.50
Gauge for Moore's Double Seamer		.75
Crank Screw for Moore's Double Seamer		.50
Thin Steel Wheel for Moore's Double Seamer		.75
Faces for Moore's Double Seamer	each	2.50
Encased Groover Ratchet, with Brass Mounting		2.50
No. 1. Groover Ratchet, with Brass Mounting		3.25
Groover Spring and Roll		.75
Groover Rollers	each	.75
Groover Crank		.50
Groover Pinion		.50
Treadles for Nos. 20, 25, and 30, Squaring Shears	each	3.00
Set of Legs for Nos. 20, 25, and 30, Squaring Shears		3.00
Steel Springs for Nos. 20, 25, and 30, Squaring Shears		1.50
One pair Extension Arms for Nos. 20, 25, or 30, Squaring Shears		1.50
Patent Back Arms, as now made, with Adjustable Screws, for Nos. 20, 25, or 30	per set	5.00
Front and Back Gauge for Nos. 20, 25, or 30, Squaring Shears	each	.75
Short Front Gauge for Nos. 20, 25, or 30	each	.25
Set of (5) Screws and Nuts for Gauge	per set	.75
Gate or Stock for Nos. 20 and 25		5.00
Gate or Stock for No. 30		6.00
Bed for No. 20 Squaring Shears, weighs 50 lbs.		9.00
Connecting Rods for Nos. 20, 25, or 30	each	1.00
Grinding Blades for Nos. 20, 25, and 30	per pair	1.75
Cranks for Small Machines	each	.50
Faces for Small Machines	each	1.00
Crank Screws for Small Machines	each	.50
Top Screws for Small Machines	each	.10
Sliding Gauge for Newton's Circular Shears		1.50
Upper Roll for Setting Down Machine		3.00
Lower Roll for Setting Down Machine		3.00
Top Plate for Setting Down Machine		1.25
Lower Post or Stand for Setting Down Machine		2.00
Lower Journal Plate for Setting Down Machine		.50
Beader Cranks	each	.50
Gauge for No. 4 Beader		.75
Beader Crank Screw		.50
Brass Top Plates for No. 1, or Raymond's Machine	each	1.25
Gauges for either Raymond's or No. 1 Large Burr	each	1.25
Hollow Mandrel Fasteners	each	.50
Extra Faces for No. 1, or Raymond's Wiring Machine	each	1.25
Roller for Setting Down Stow's Double Seamer		2.50

WEITZEL'S FRUIT CAN MACHINE.

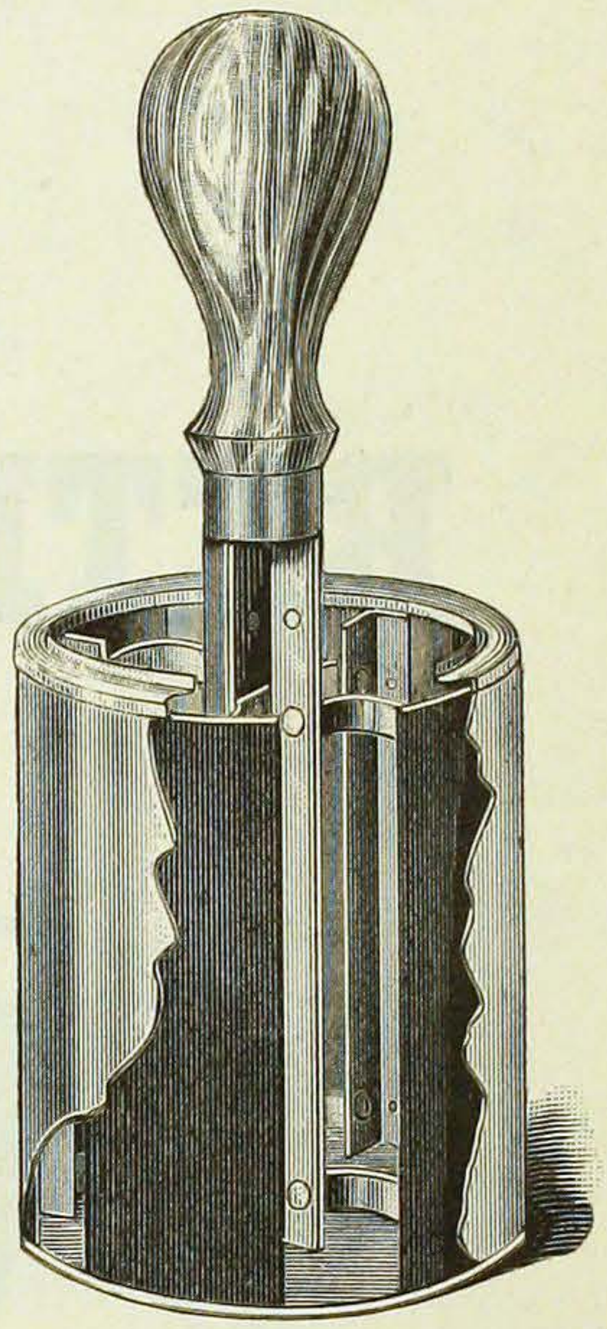


This Machine is for expanding and holding fruit cans for soldering.

DIRECTIONS.—After putting the can together, standing same on bench, drop the Machine inside of opening, press down on the handle until the Machine expands and takes hold, when the can will be ready for soldering.

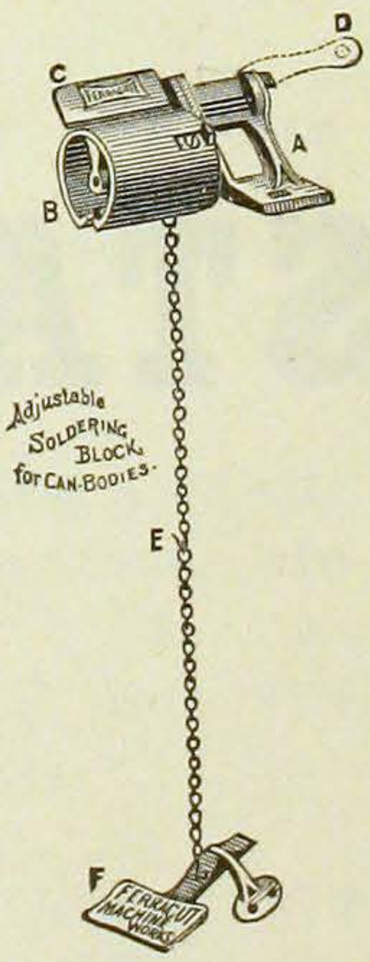
To remove the Machine, pull up on the handle.

Price . . . . each $1.50



ADJUSTABLE SOLDERING BLOCK FOR CAN BODIES.

Seamer frame, etc., is shown at A, C, E, F, and weighs (without cylinder) nine pounds. It consists of an inclined frame A; lever and "knife" C; chain E, treadle and fulcrum F, etc. A slot in frame allows the use of different cylinders B, from one pound to one gallon, and for their adjustment up and down. A slot in the lever allows the knife to be set out for varying lengths of cylinders. Adjustments are also provided in the length of the chain, leverage of treadle, position of cylinder around its centre, and "set" of the knife. The latter has a groove to prevent "tinning." A "back action" lever D is now furnished, instead of the front action one shown. The chain passes through the bench and hooks in at D. The action of the foot raises the knife, and the spring does the holding down. If not specified in ordering, the "back-action" will be understood. For price of complete seamer, add separate cylinders, as in table below.

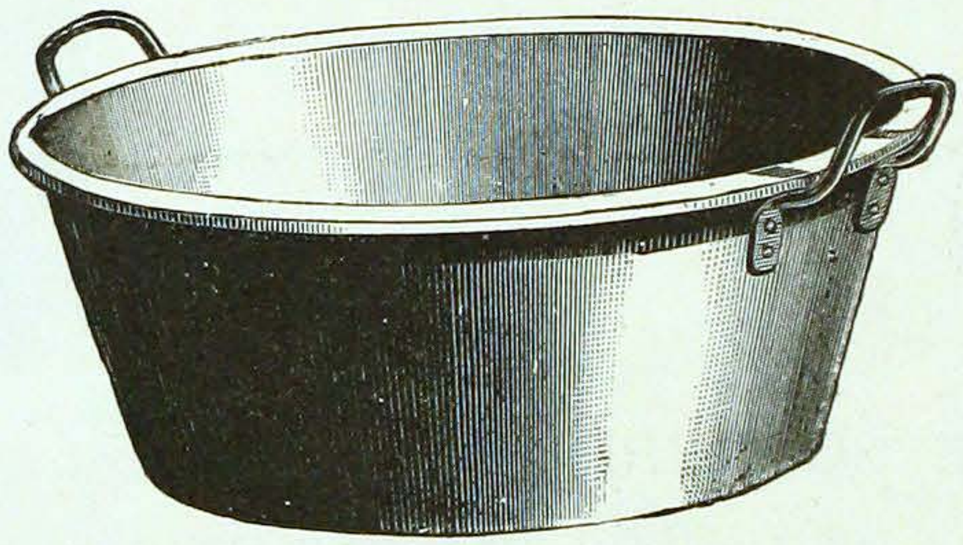


Price of frame, treadle, etc., without cylinder $2.50

Separate Round Cylinders, are furnished for gauging and soldering side seams of cans. They have improved double wedge expanders and two adjustable gauges for the tin, by which the latter can be set flush with front end. Being cast hollow and thin, they get hot quickly, but do not accumulate too much heat. They are somewhat longer than the average can, and are turned true to a size one-sixteenth inch smaller than the outside diameter of can body. They can then be expanded (either end separately) until they fit the inside. Variations in size, if more than one-sixteenth inch either way, will be made to order at extra charge. Double length cylinder (including long "knife") two and a half times the prices given below:

Nominal size	1 lb.	2 lb.	2½ lb.	3 lb.	2 qt.	1 gal.
Length	ins. $4\frac{1}{2}$	$4\frac{3}{4}$	5	$5\frac{1}{4}$	$6\frac{1}{2}$	$7\frac{3}{4}$
Diameter	ins. $2\frac{15}{16}$	$3\frac{7}{16}$	$3\frac{15}{16}$	$4\frac{3}{16}$	$4\frac{15}{16}$	$6\frac{3}{16}$
Price	$1.75	$2.00	$2.25	$2.50	$3.25	$4.50

RETINNED DEEP

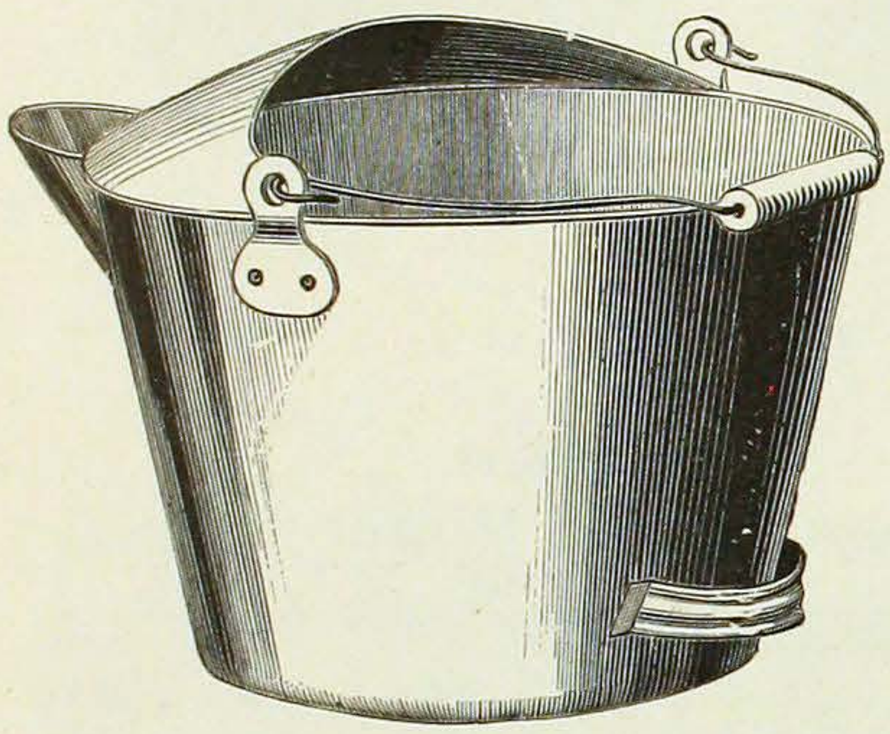


STAMPED WARE.



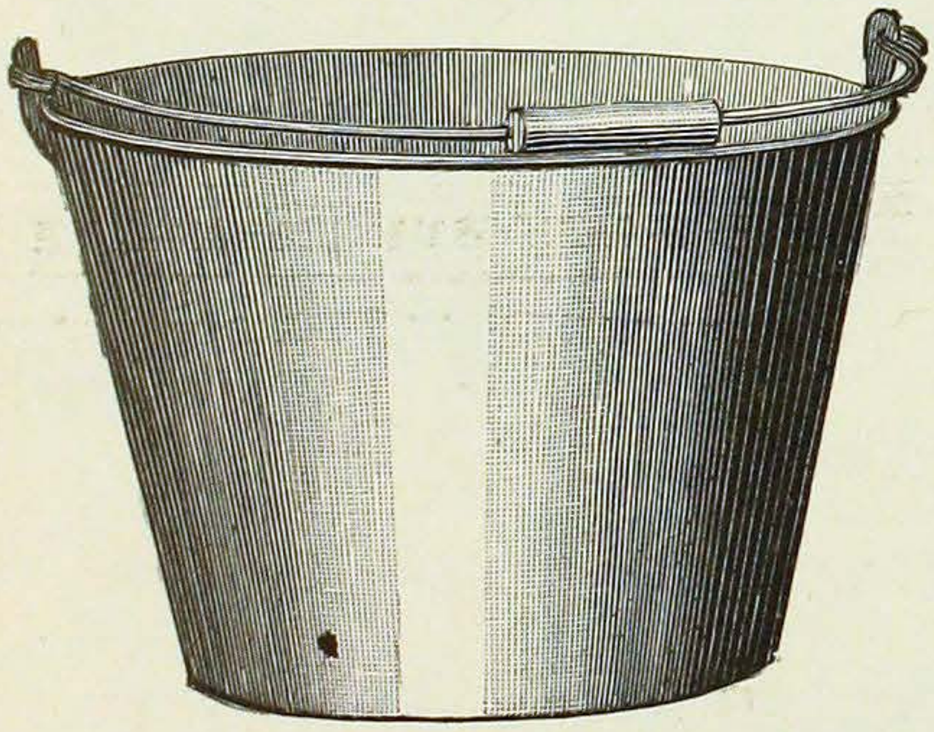
Retinned Seamless Water Pitchers.

No.	**1**	**2**	**3**	**4**
Quarts	1½	2	3	4
Retinned, per dozen				



Retinned Seamless Milk Pails.

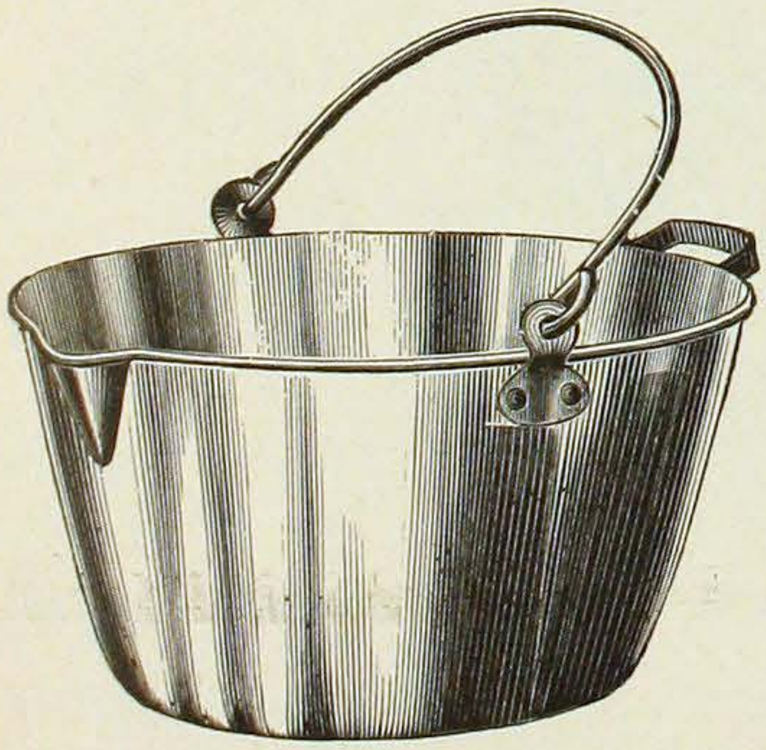
No.	**5**
Gallons.	3
Inches	12½x8¼
Retinned, per dozen	



Retinned Seamless Water Pails or Wash Kettles.

No.	**4**	**5**	**6**	**7**	**8**
Gallons .	½	1	1½	1¾	2
Inches .	7½x4¾	8½x5	9x5¼	9½x5¾	10¼x6½
Retinned, per doz.					

No.	**8½**	**9**	**10**	**11**	**12**
Gallons .	2½	3	4	6	8
Inches .	11½x7½	12½x8¼	13½x8¾	14¾x9	16¾x10
Retinned, per doz.					



Retinned Lipped Preserving Kettles.

No.	**160**	**180**	**200**	**220**	**240**
Quarts.	2	2½	3	4	5
Inches . .	7x3½	7¾x3½	8¼x3¾	9½x4	9¾x4¼
Retinned, per doz.					

No.	**260**	**280**	**300**	**320**
Quarts.	6	8	10	12
Inches . .	10¾x5	11¼x4⅞	11¾x5¼	13¼x5¼
Retinned, per doz.				



Retinned Seamless Water Buckets.

FLAT BOTTOM.

No.	106	108	110	112	114	116
Quarts .	6	8	10	12	15	20
Inches .	9x6½	9½x6¾	10½x7¾	11½x8¾	12x9¾	13x10¾
Retinned, per doz.						

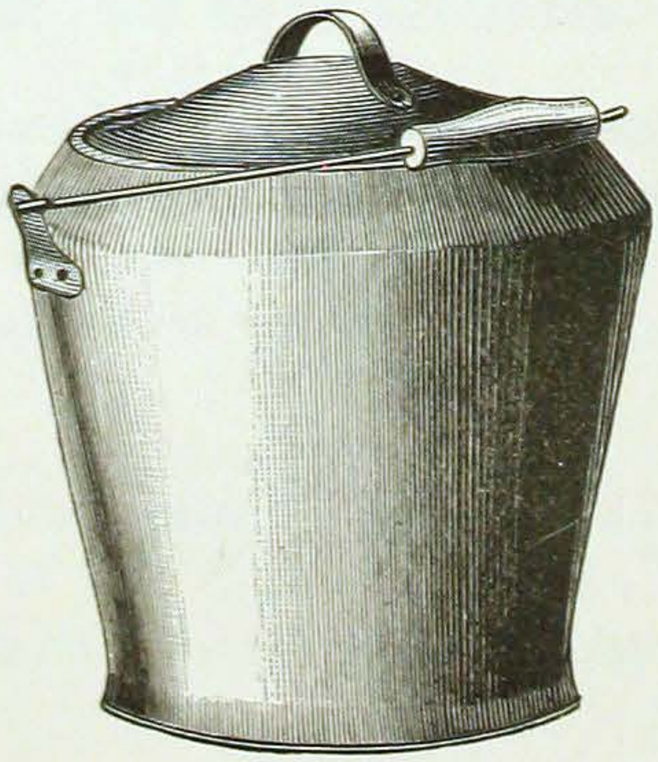


Retinned Seamless Flaring Water Pails.

WITH PATENT SEAMLESS FOOT.

No.	206	208	210
Quarts	6	8	10
Inches	9x6¾	9½x7	10½x8
Retinned, per doz. . .			

No.	212	214	216
Quarts	12	15	20
Inches	12½x9	12x10	13x11
Retinned, per doz . .			



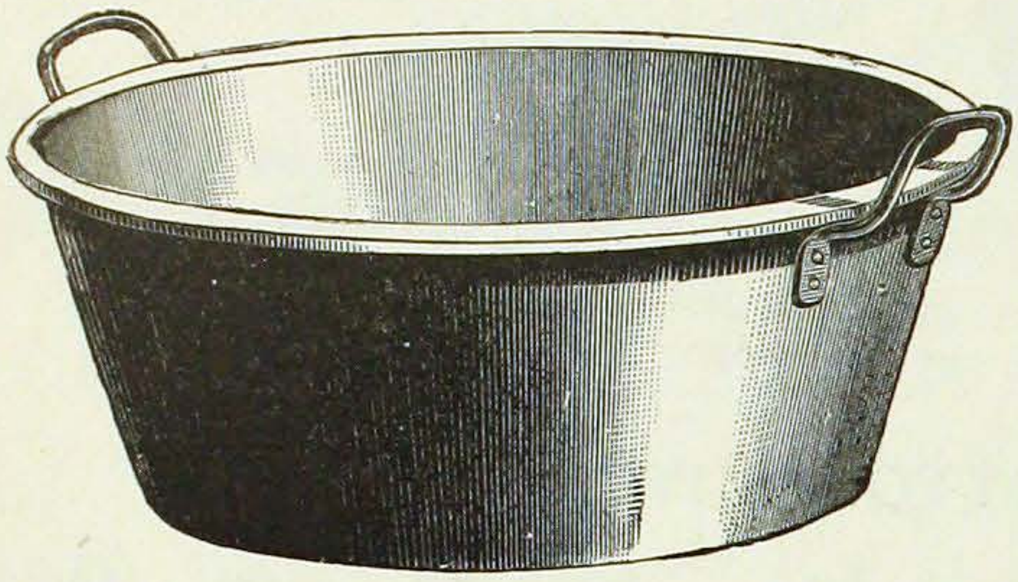
Retinned Seamless Chamber Pails.

WITH PATENT SEAMLESS FOOT.

No.	3
Gallons	3½
Inches	11½x10¾
Retinned, per doz.	

RETINNED LIGHT DISH OR RINSING PANS.

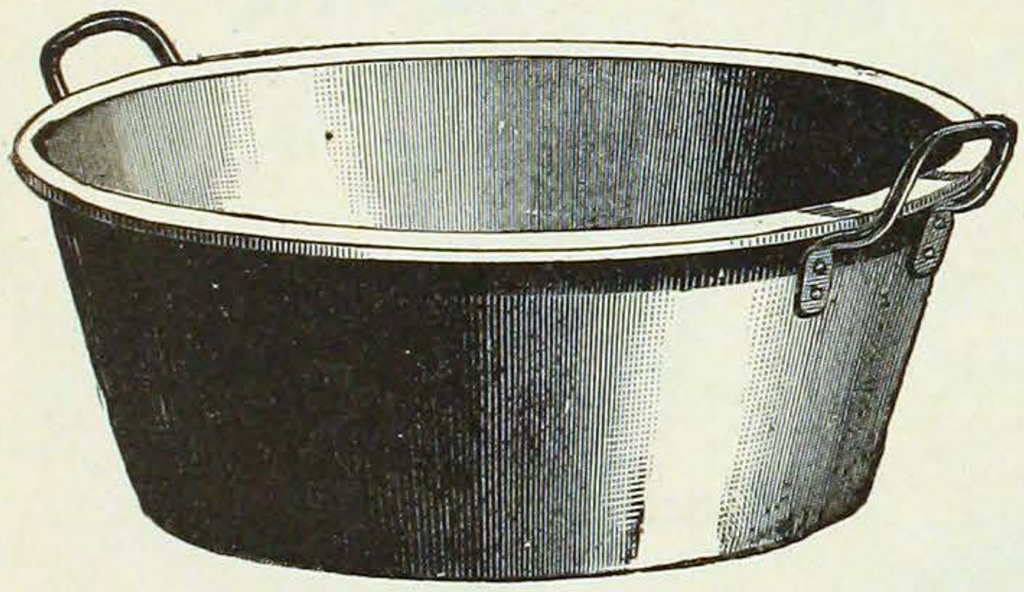
IMPROVED SHAPE.



No.	**7**	**8**	**10**
Inches . .	13¼x4¼	14x4½	14¾x5
Quarts . .	7	8	10
Retinned, I. X., per doz.			
I. C., per doz.			

No.	**14**	**17**	**21**
Inches . .	16¼x5¼	17¾x5⅝	19⅜x5⅞
Quarts . .	14	17	21
Retinned, I. X., per doz.			
I C., per doz.			

RETINNED DEEP DISH PANS.



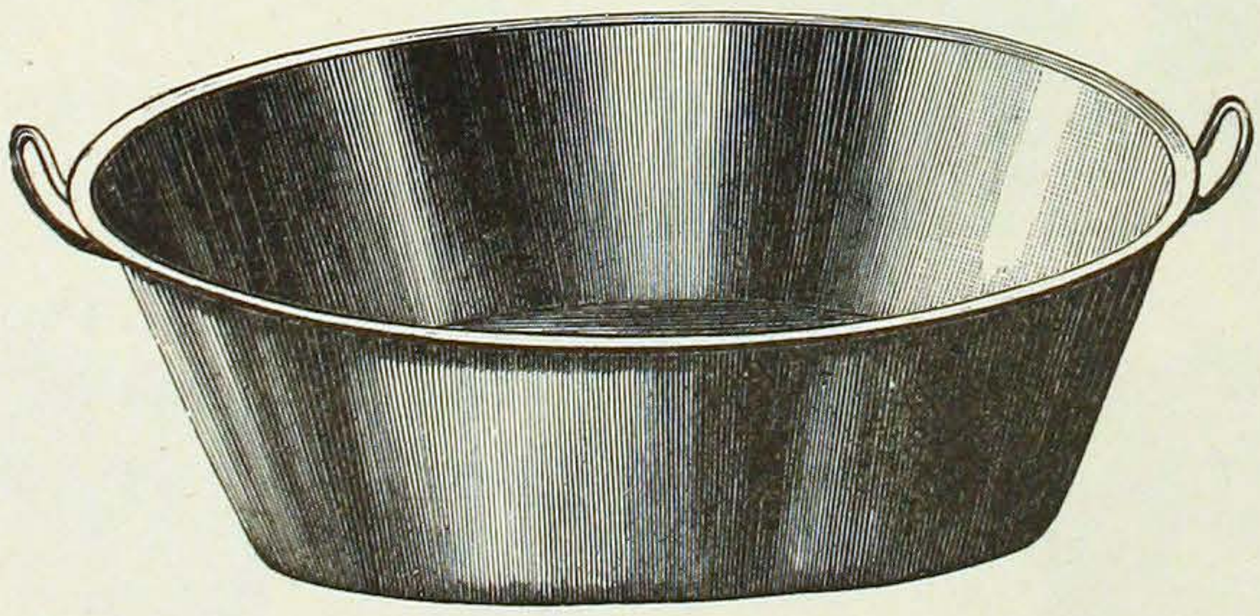
	MEDIUM.				
Qts.	**8**	**10**	**14**	**17**	**21**
Inches.	14x4½	14¾x5	16¼x5¼	17¾x5⅝	19⅜x5⅞
Retin'd, I. X. X., per doz.					

	HEAVY.				
Qts.	**10**	**14**	**17**	**21**	**30**
	IXXX.	IXXX.	IXXX.	IXXXX.	IXXXX
Inch's	14¾x5	16¼x5¼	17¾x5⅝	19⅜x5⅞	21¼x6¾
Retin'd, per doz.					

EXTRA HEAVY.

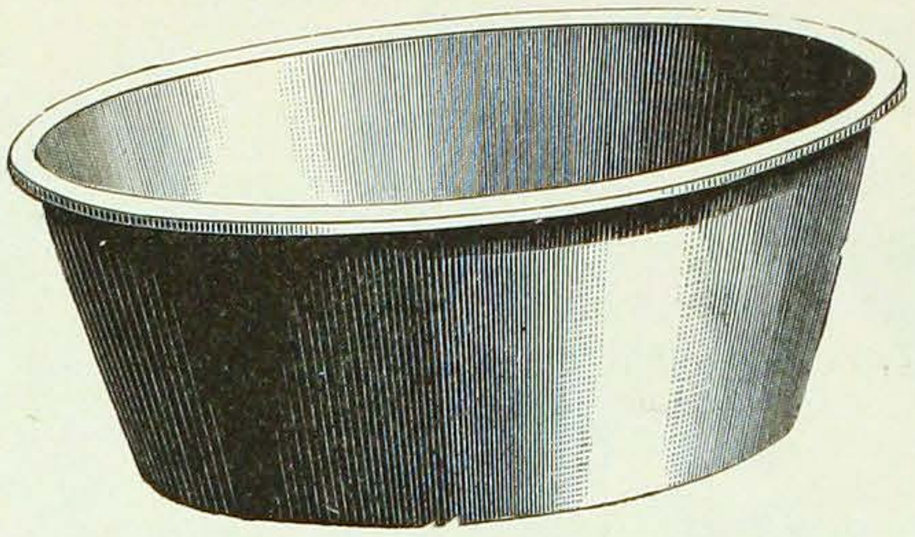
Qts.	**40**
Inches	24¼x7½
Retinned, per doz.	

RETINNED OVAL DISH PANS.



Qts.	**15**	**18**	**22**
Inches	18x14¼x5	19½x16⅝x5¼	21½x17x5¾
Retinned, per doz.			

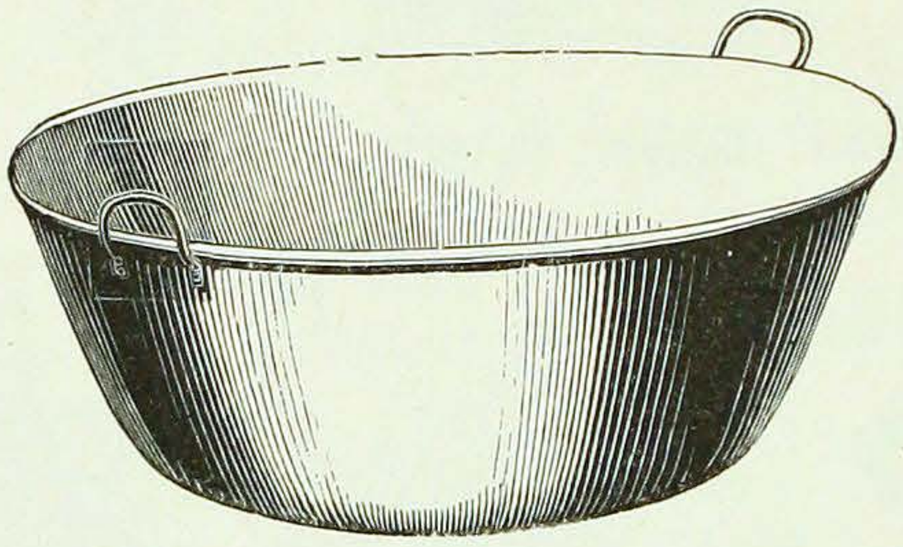
RETINNED MIXING PANS.



Qts.	7	8	10
Inches .	13¾x4⅛	14¾x4¼	15¼x4½
Retinned, per doz.			

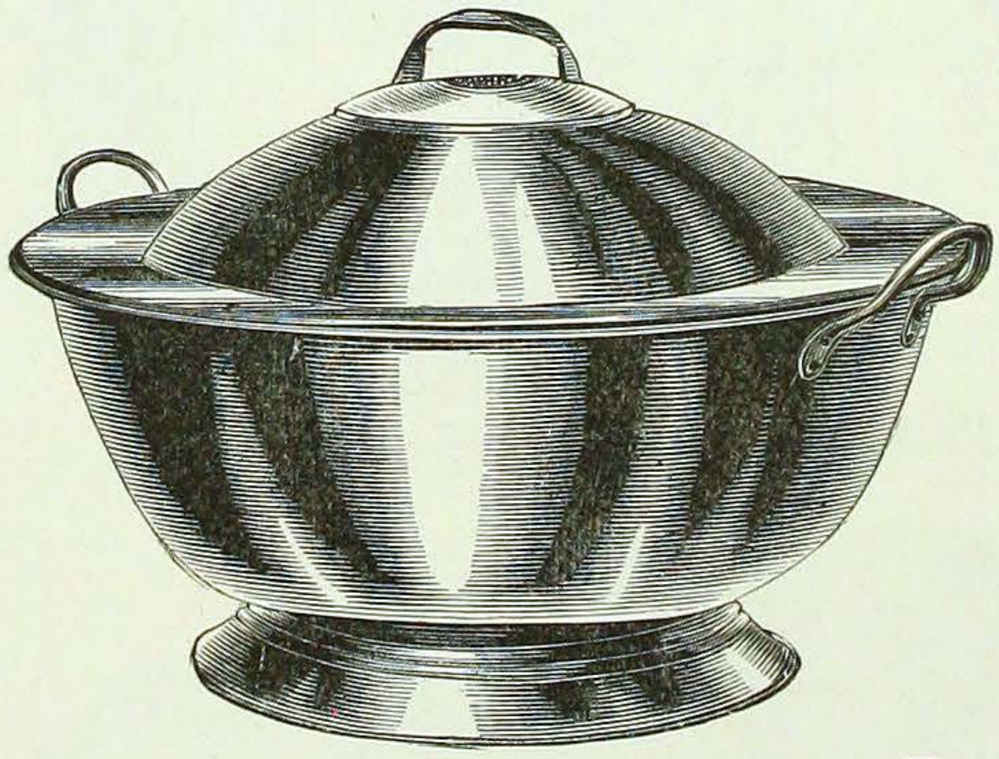
Qts.	14	17	21
Inches .	16¾x5	18¼x5½	20¼x5¾
Retinned, per doz.			

RETINNED ROUND BOTTOM KITCHEN PANS.



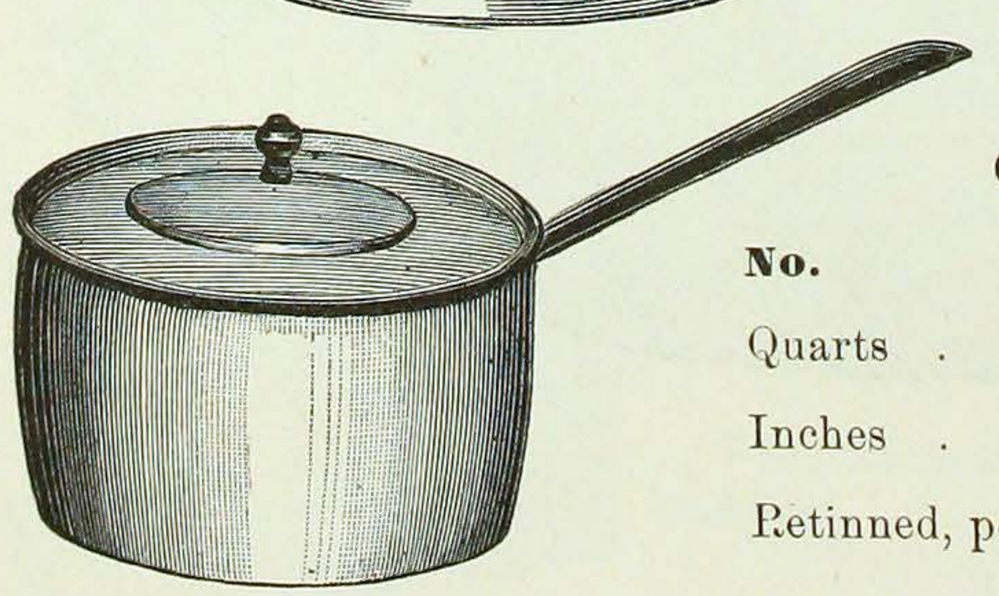
No.	60	80	100	120
Quarts.	6	8	10	12
Inches .	11¼x4	12¾x4½	13⅝x4¾	14¼x5¼
Retin'd, per doz.				

No.	140	170	210
Inches .	16½x6	17¾x6½	19⅝x6¾
Quarts .	14	17	21
Retinned per doz.,			



Retinned Bread Raisers.

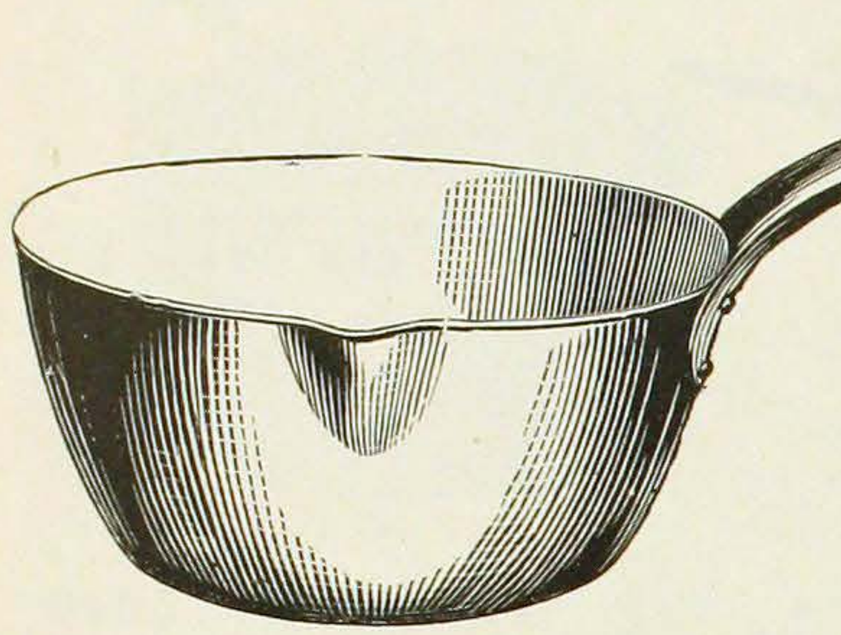
Qts.	10	14	17	21
Inches .	13¾x6½	16½x7¾	17¾x8¼	19⅝x8½
Retin'd, per doz.				



Retinned Patent Covered "Berlin" Saucepans.

No.	02	03	04	06	08
Quarts . . .	1	2	3	5	7
Inches . . .	6x3	7x3½	8¼x4	9x5	10x5½
Retinned, per doz.					

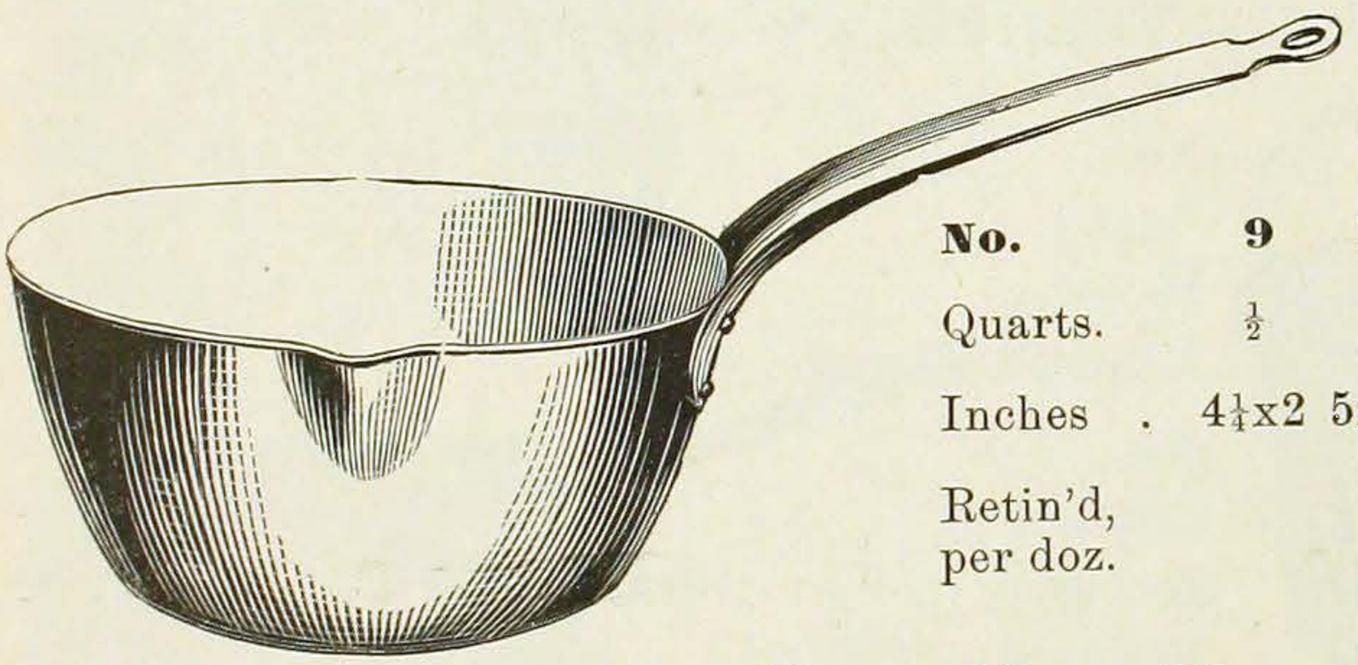
RETINNED LIGHT LIPPED SAUCEPANS.



No.	**09**	**010**	**012**	**014**	**016**	**018**
Quarts.	½	¾	1	1½	2	2½
Inches .	4¼x2	5x2¼	6x2½	6½x3¼	7x3½	7¾x3½
Retin'd, per doz.						

No.	**020**	**022**	**024**	**026**	**028**
Quarts.	3	4	5	6	7½
Inches	8½x3¾	9x4	9¾x4¼	11x4½	11¼x4⅞
Retinned, per doz.					

RETINNED STRONG LIPPED SAUCEPANS.

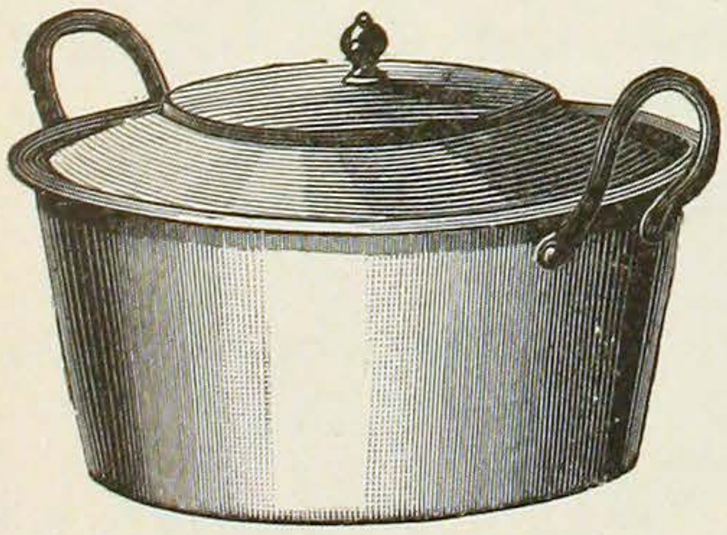


No.	**9**	**10**	**12**	**14**	**16**	**18**
Quarts.	½	¾	1	1½	2	2½
Inches .	4¼x2	5x2½	6x2½	6½x3¼	7x3½	7¾x3½
Retin'd, per doz.						

No.	**20**	**22**	**24**	**26**	**28**	**30**
Quarts.	3	4	5	6	7½	10
Inches	8½x3¾	9x4	9¾x4¼	11x4½	11¼x4⅞	11¾x5¼
Retinned, per doz.						

RETINNED PATENT COVERED "WINDSOR" SAUCE POTS.

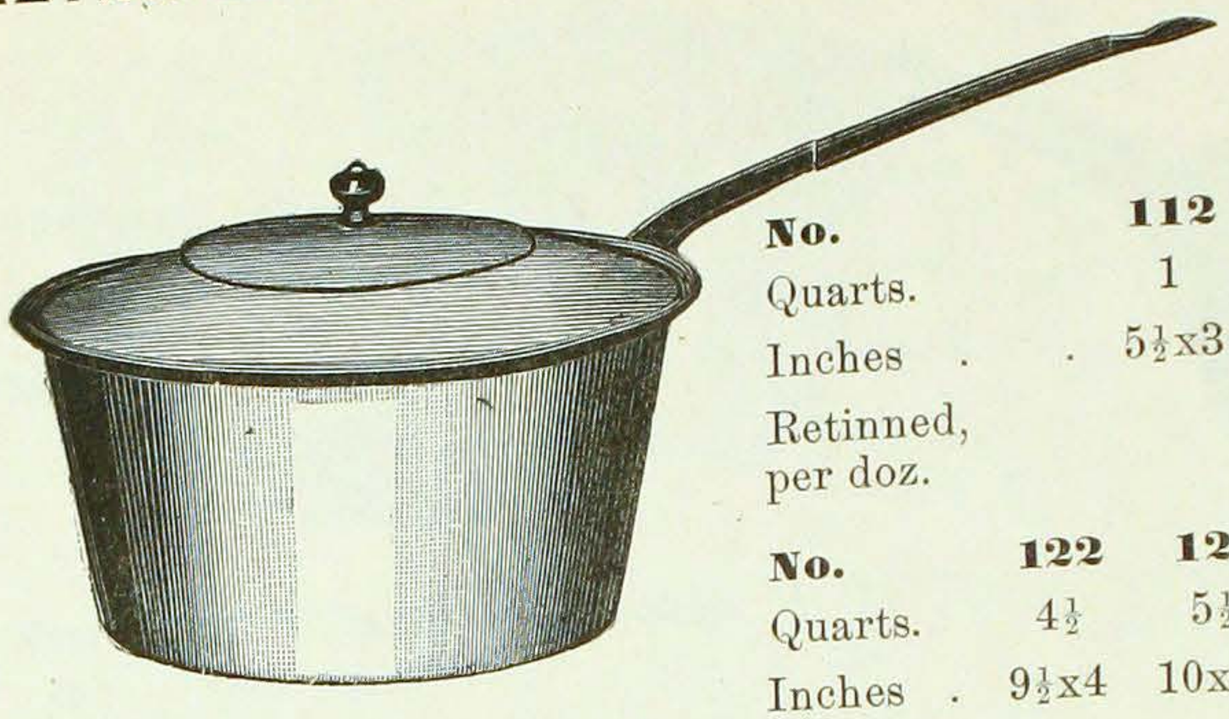
With Side Handles.



No.	**112**	**114**	**116**	**118**	**120**
Quarts.	1	1½	2	2½	3½
Inches . .	5½x3	6½x3¼	7½x3½	8x4	8¾x4
Retin'd, per doz.					

No.	**122**	**124**	**126**	**128**	**130**
Quarts.	4½	5½	6½	8	10
Inches .	9½x4	10x4¾	10¾x5	11½x5¼	12½x5¼
Retinned, per doz.					

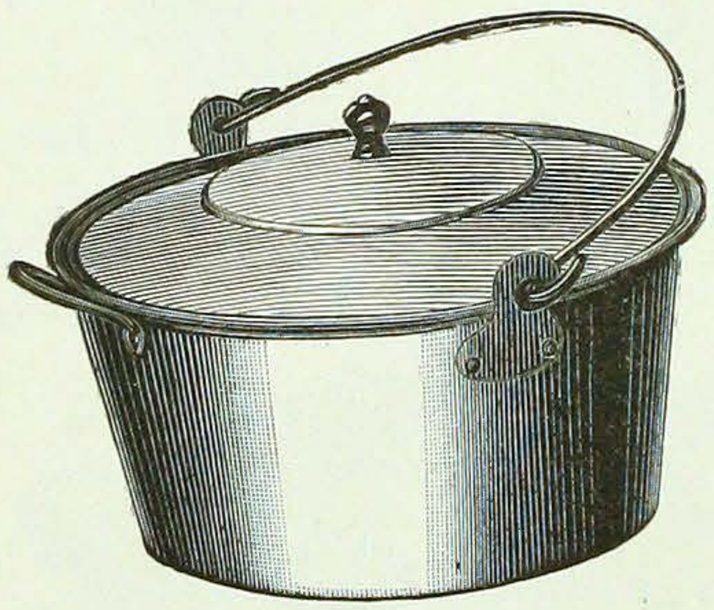
RETINNED PATENT COVERED "WINDSOR" SAUCEPANS.



No.	112	114	116	118	120
Quarts.	1	1½	2	2½	3½
Inches . .	5½x3	6½x3¼	7½x3½	8x4	8¾x4
Retinned, per doz.					

No.	122	124	126	128	130
Quarts.	4½	5½	6½	8	10
Inches .	9½x4	10x4¾	10¾x5	11½x5¼	12½x5¼
Retin'd, per doz.					

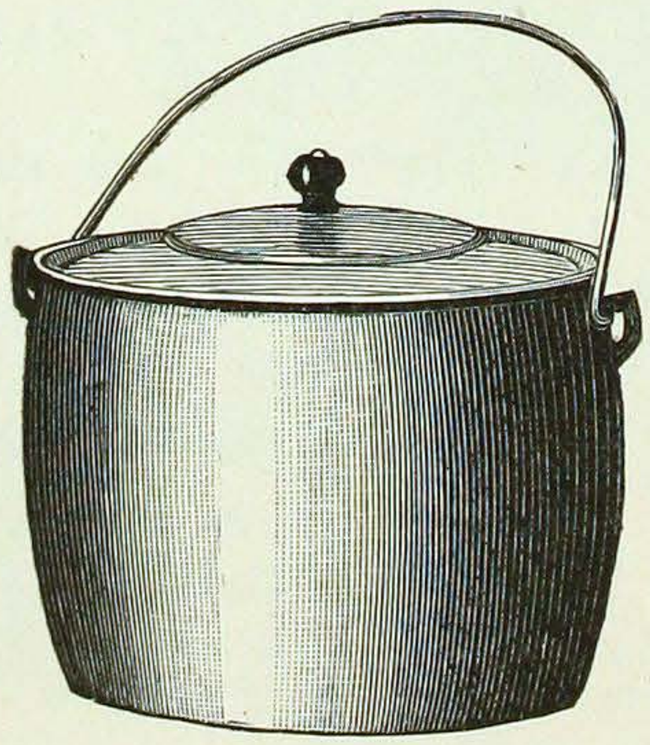
RETINNED PATENT COVERED "WINDSOR" KETTLES.



No.	416	418	420	422
Quarts.	2	2½	3½	4½
Inches . . .	7½x3½	8x4	8¾x4	9½x4
Retinned, per doz.				

No.	424	426	428	430
Quarts.	5½	6½	8	10
Inches . .	10x4¾	10¾x5	11½x5¼	12½x5¼
Retinned, per doz.				

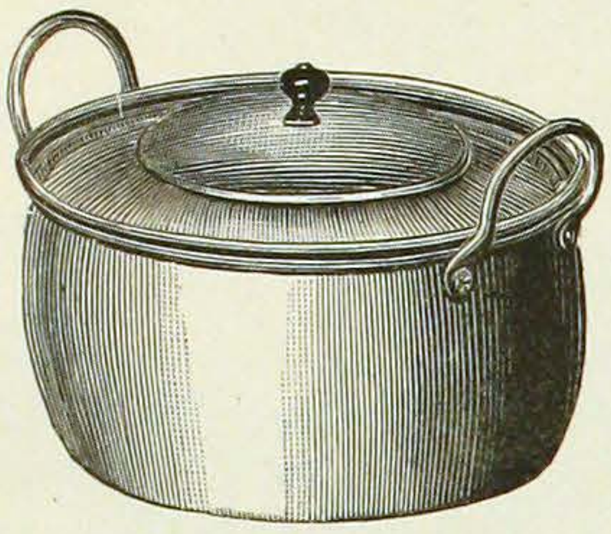
RETINNED COVERED SEAMLESS CONVEX COOKING POTS.



No.	200	201	202	203	204
Quarts.	½	1	2	3	4
Inches . . .	4⅛x3	4¾x4	6x4½	7x5	8½x5¼
Retinned, per doz.					

No.	206	208	212	214	218
Quarts.	6	8	12	14	18
Inches .	9¼x6¾	10¼x7¼	11¼x8	12¼x8¾	12½x9½
Retin'd, per doz.					

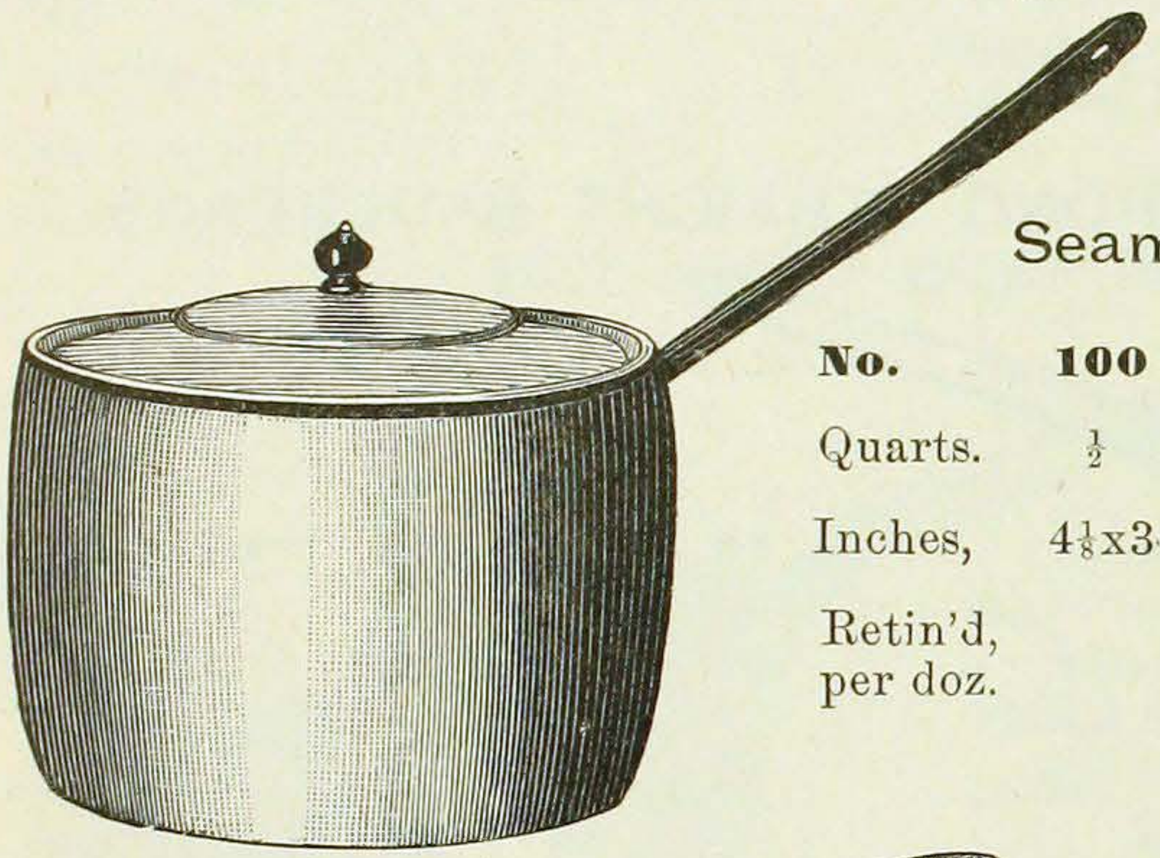
Retinned Covered Seamless Convex Sauce Pots.



With Side Handles.

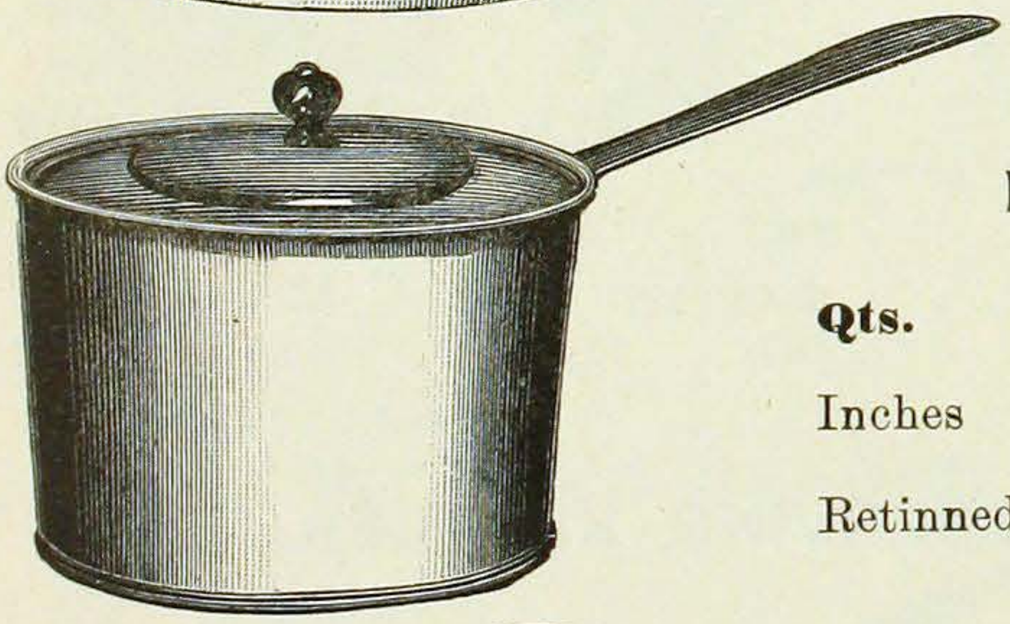
No.	**16**	**18**	**20**	**22**
Quarts . .	1	2	3	4
Inches . .	6x3	7x3⅜	8x4	9x5
Retinned, per doz.				

No.	**24**	**26**	**28**	**30**
Quarts . .	7	9	13	18
Inches . .	10¼x6	11¼x6¼	12½x7¼	13x8¼
Retinned, per doz.				



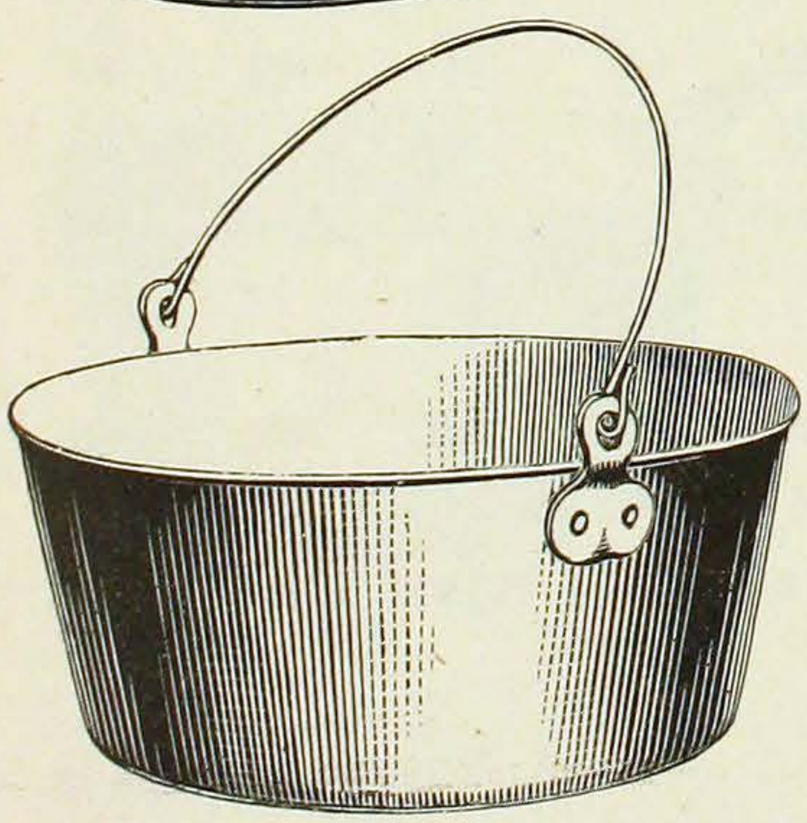
Retinned Covered Seamless Convex Saucepans.

No.	**100**	**101**	**102**	**103**	**104**	**106**	**108**
Quarts.	½	1	2	3	4	6	8
Inches,	4⅛x3	4⅜x4	6x4½	7x5	8½x5¼	9¼x6¾	10¼x7¼
Retin'd, per doz.							



Retinned Patent Pieced Saucepans.

Qts.	**2**
Inches	6½x4½
Retinned, per doz.	



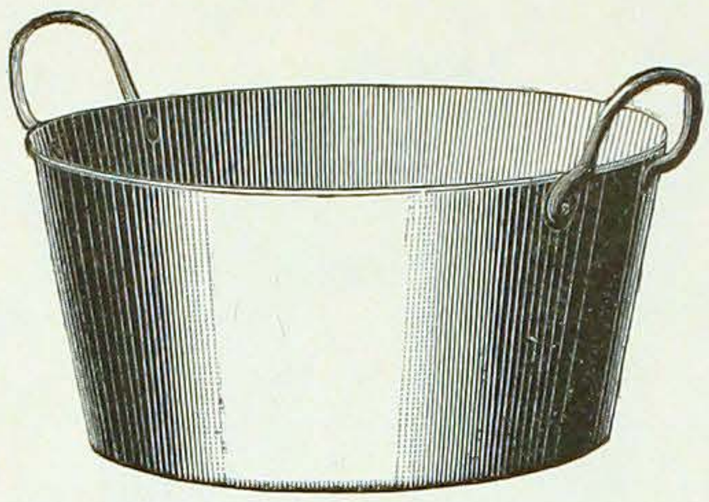
Retinned Shallow Preserving Kettles.

No.	**016**	**018**	**020**	**022**
Quarts . .	2	2½	3	4
Inches . .	7x3	7¾x3⅛	8½x3¼	9¼x3½
Retinned, per doz.				

No.	**024**	**026**	**028**	**030**
Quarts . .	5	6	7½	9½
Inches . .	9½x4	10¼x4¼	10¾x4¼	12x4¾
Retinned, per doz.				

RETINNED EXTRA STRONG STRAIGHT SAUCE POTS.

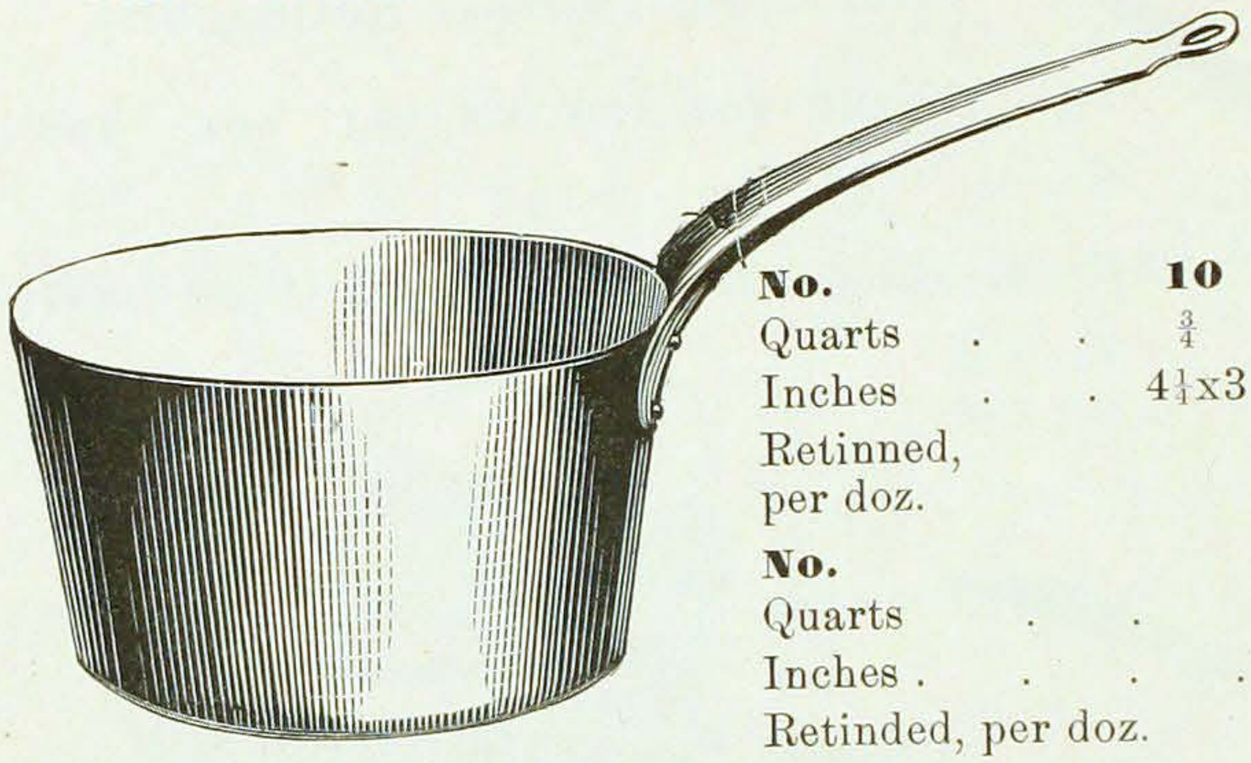
With Side Handles.



No.	**16**	**18**	**20**	**22**	**24**
Quarts	2	2½	3½	4½	5½
Inches	6¾x3¾	7¾x4	8½x4½	9¼x4¾	10x5
Retinned, per doz.					

No.	**26**	**28**	**30**	**32**	**36**
Quarts	6½	8	10	12	14
Inches	10¾x5	11½x5½	12¼x5½	13x5¾	14¼x6
Retinned, per doz.					

RETINNED EXTRA STRONG STRAIGHT SAUCEPANS.

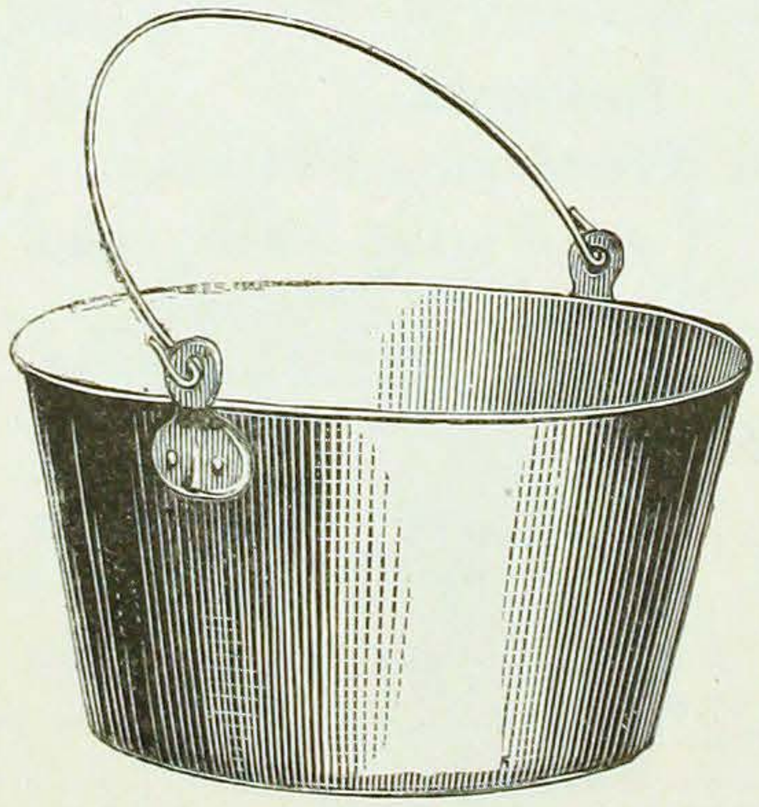


No.	**10**	**12**	**14**	**16**	**18**
Quarts	¾	1	1½	2	2½
Inches	4¼x3	5¼x3¼	6x3½	6¾x3¾	7¾x4
Retinned, per doz.					

No.	**20**	**22**	**24**	**26**
Quarts	3½	4½	5½	6½
Inches	8½x4½	9¼x4¾	10x5	10¾x5
Retinded, per doz.				

No.	**28**	**30**	**32**	**36**
Quarts	8	10	12	14
Inches	11½x5½	12¼x5½	13x5¾	14¼x6
Retinned, per doz.				

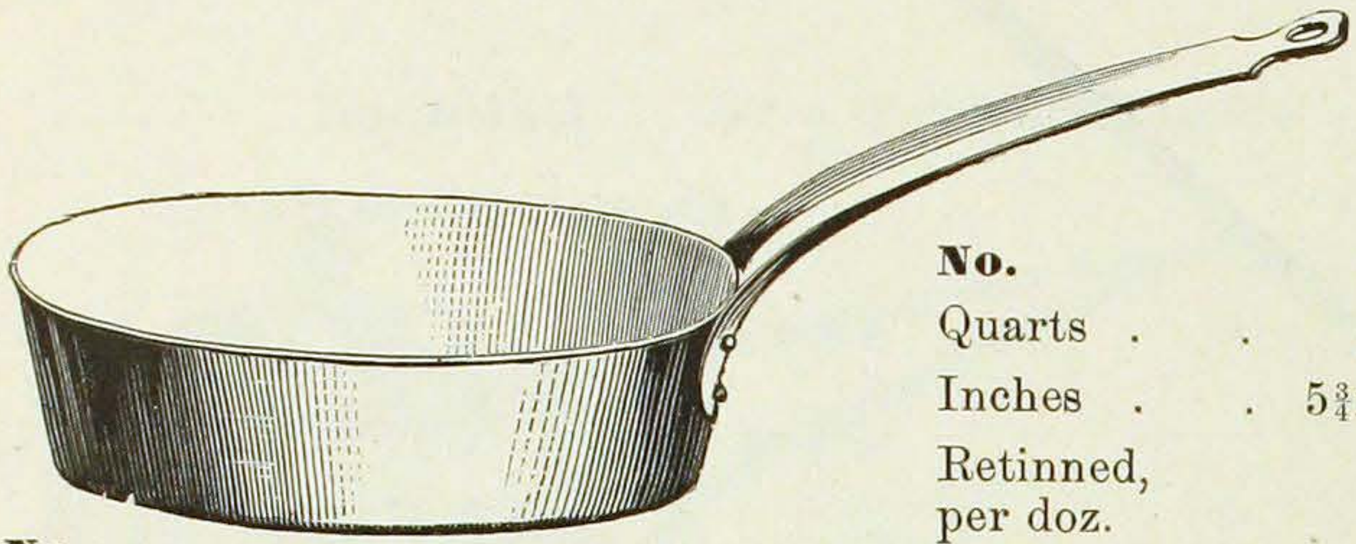
RETINNED DEEP PRESERVING KETTLES.



No.	**16**	**18**	**20**	**22**	**24**
Quarts	2	2½	3½	4½	5½
Inches	7½x3½	8x4	8¾x4	9½x4	10x4¾
Retin'd, per doz.					

No.	**26**	**28**	**30**	**32**	**36**
Quarts	6½	8	10	12	14
Inches	10¾x5	11½x5¼	12½x5¼	13¼x5¼	14¼x6½
Retin'd, per doz.					

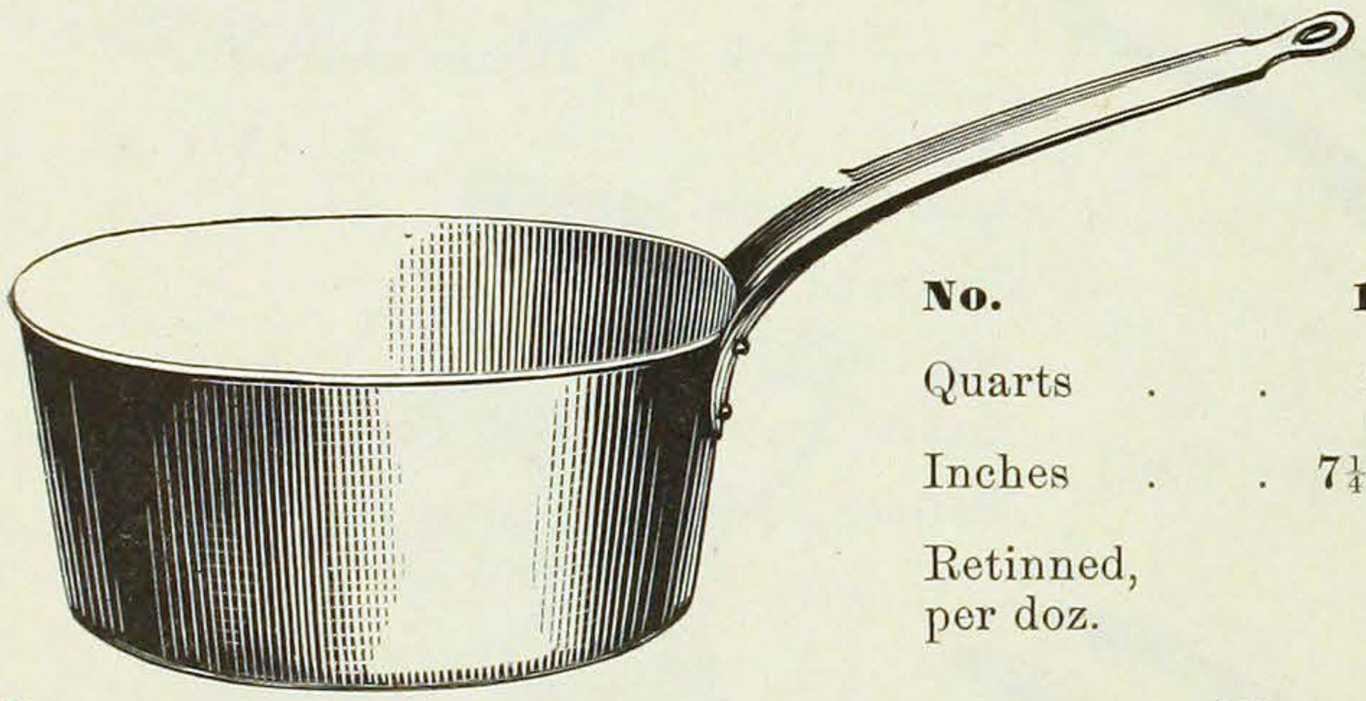
RETINNED SHALLOW STEW PANS.



No.	1	2	3	4	5
Quarts	½	1	1½	2	3
Inches	5¾x1½	6½x1¾	7¼x2	8x2½	8¾x2½
Retinned, per doz.					

No.	6	7	8	10
Quarts	4	5	6	10
Inches	10¼x2¾	11¼x2¾	12x2¾	14x3
Retinned, per doz.				

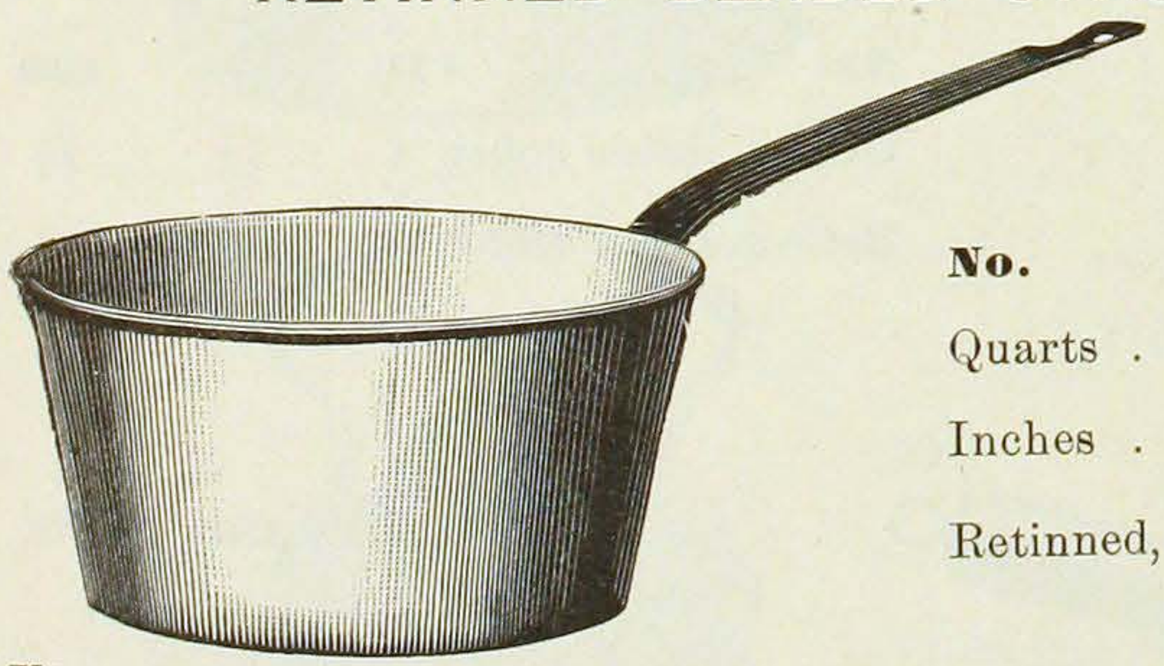
RETINNED DEEP STEW PANS.



No.	16	18	20	22
Quarts	2	2½	3	4
Inches	7¼x2¾	7½x3¼	8½x3¼	9¾x3½
Retinned, per doz.				

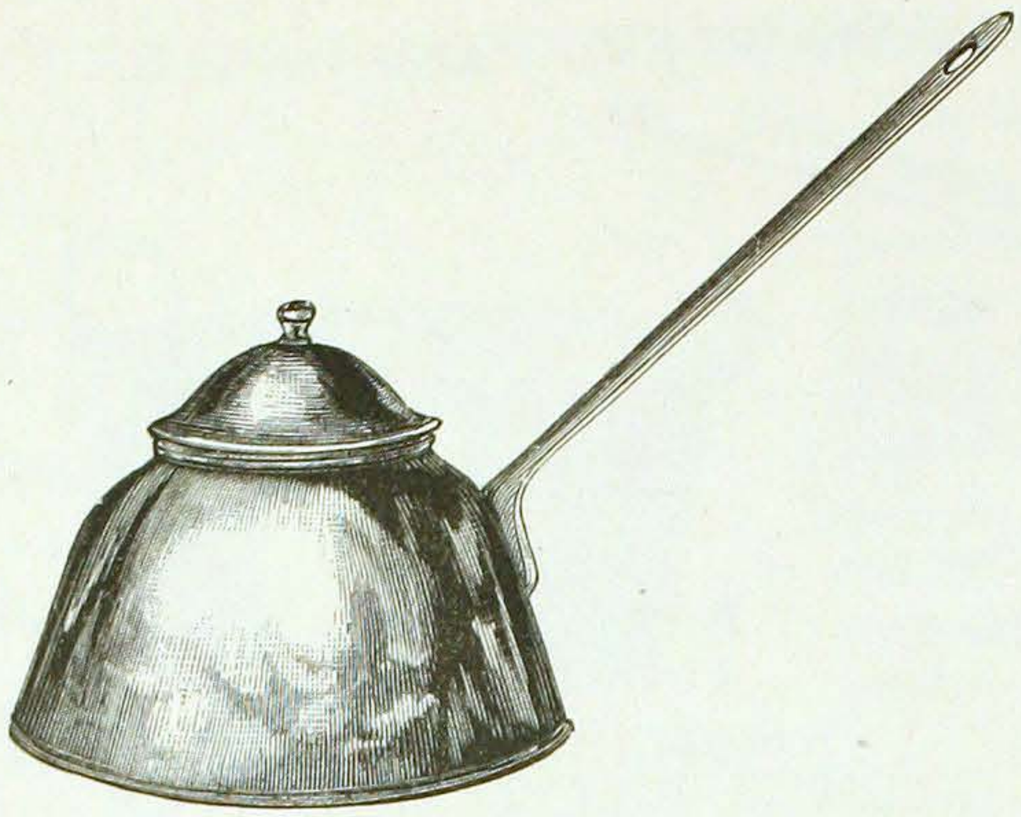
No.	24	26	28	30
Quarts	5	6	7½	9½
Inches	9½x4	10½x4¼	11x4½	12x5
Retinned, per doz.				

RETINNED BEADED STRONG SAUCEPANS.



No.	18	20	22	24
Quarts	2½	3½	4½	5½
Inches	7¾x4	8½x4½	9x4¾	9½x5
Retinned, per doz.				

No.	26	28	30
Quarts	6½	8	10
Inches	10x5½	11⅜x5¾	12x6
Retinned, per doz.			



Retinned Oyster Stew Pans.

No.	0	1	2	3	4
Quarts. . .	1½	2	2½	3	4
Retinned, per doz.					



Retinned Milk or Rice Boilers.

No.	1	2	3	4
Quarts, inside boiler,	1	1½	1¾	2
Retinned, per doz.				

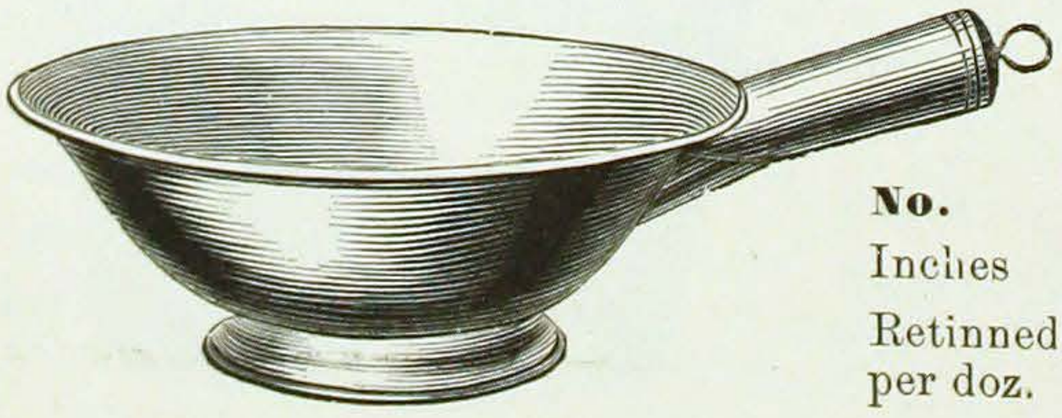
No.	5	5½	6
Quarts, inside boiler,	3	4	5
Retinned, per doz.			



Retinned Milk or Rice Boilers.

NEW PATTERN.

No.	116	118	120
Quarts, inside boiler, 1		1½	2½
Retinned, per doz.			

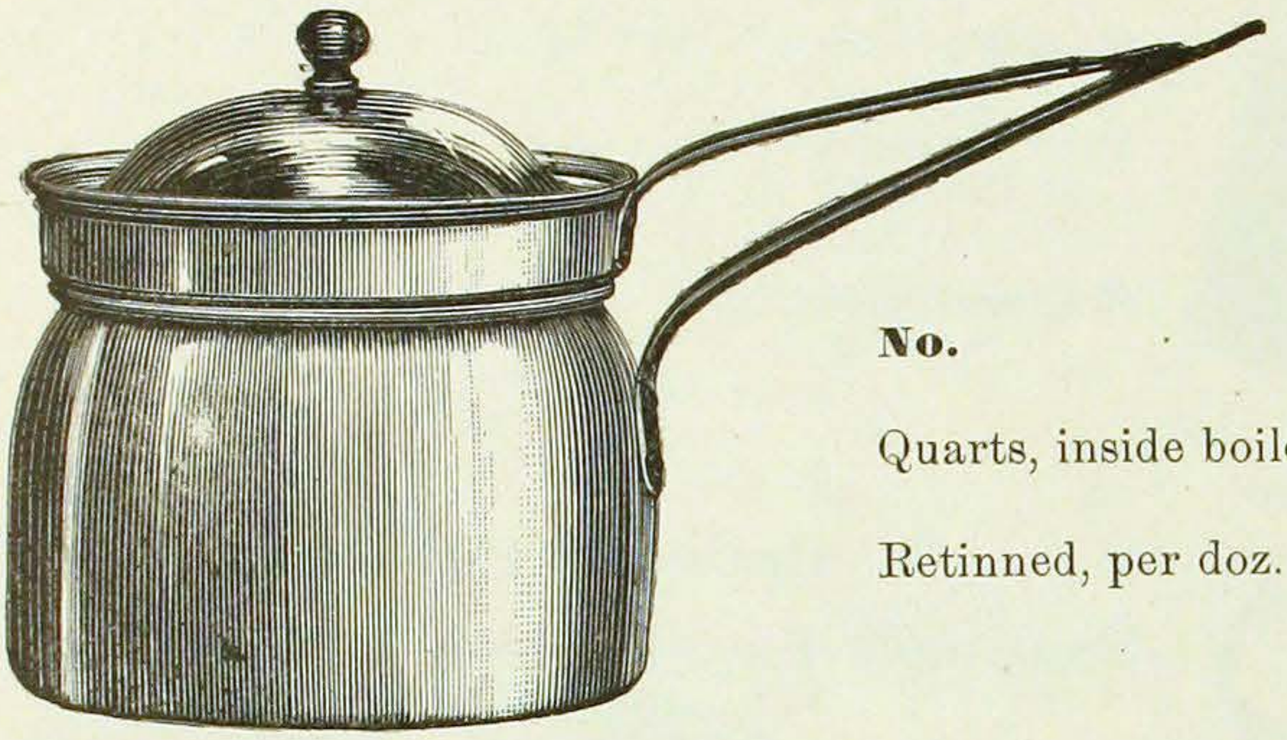


Retinned Wash Bowls—Ring Handled.

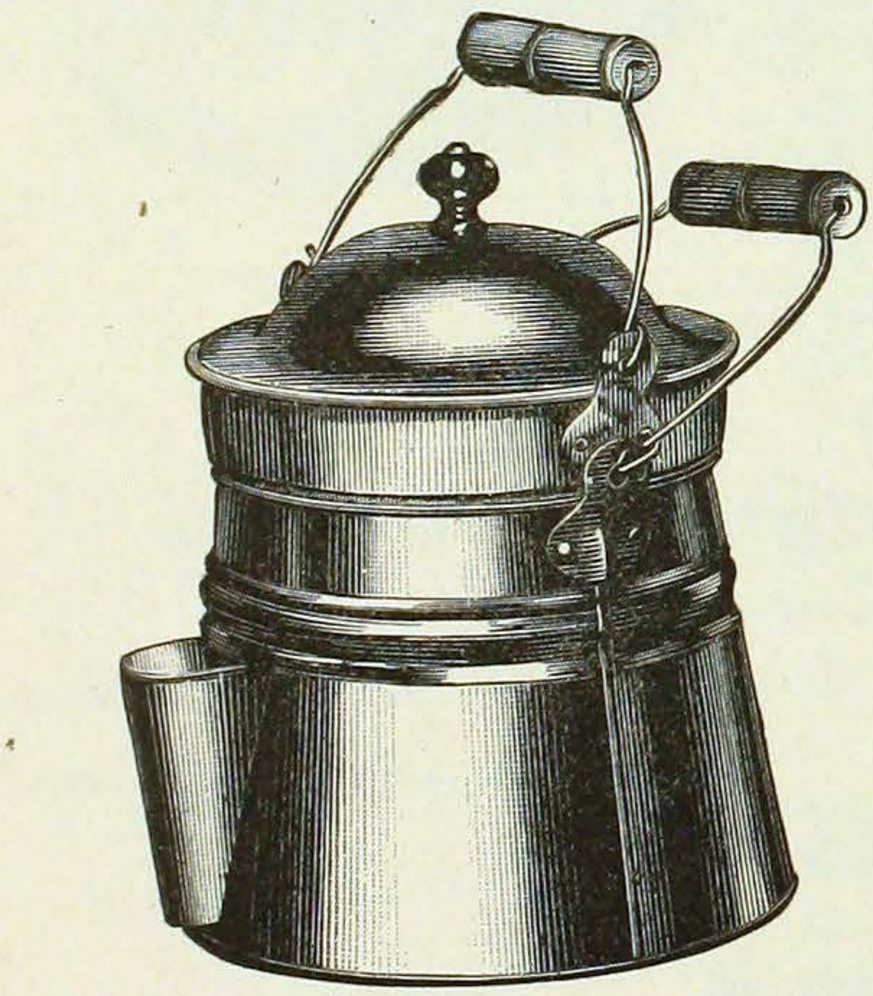
No.	101	102	103	104
Inches . .	9⅝x2¾	10⅝x3	11⅜x3⅜	12¾x3⅞
Retinned, feet fast, per doz.				

RETINNED PATENT SEAMLESS MILK OR RICE BOILERS.

COVER FITS BOTH VESSELS.



No.	52	53	54	56
Quarts, inside boilers,	1	2	3	4
Retinned, per doz.				



Retinned Farina Boilers.

No.	216	218	220
Quarts, inside boiler,	1	1½	2
Retinned, per doz.			



Retinned Tea Kettles.

No.	31	31½	32	33	34	35	36
Quarts . .	2	3	4	5	6	8	12
Diam. in Inches of Bottom.	4	5	5¾	6½	6¾	7¾	8¾
Retinned, per doz.							



Retinned Flat-Bottom Tea Kettles.

No.	16	18	20	22	24	26	28
Quarts	1½	2½	3	4	5	7	9
Diam. in Inches of Bottom.	7	7¾	8¼	9	10	11	12
Retinned, per doz.							



Retinned Patent Seamless Flat-Bottom Tea Kettles.

No.	302	303	304	306	308
Quarts	2	3	4	6	8
Diam. in Inches of Bottom.	6	7	8	9	10
Retinned, per doz.					

RETINNED LIGHT WASH BOWLS—WITH RINGS.

We always send feet loose when not ordered fast.



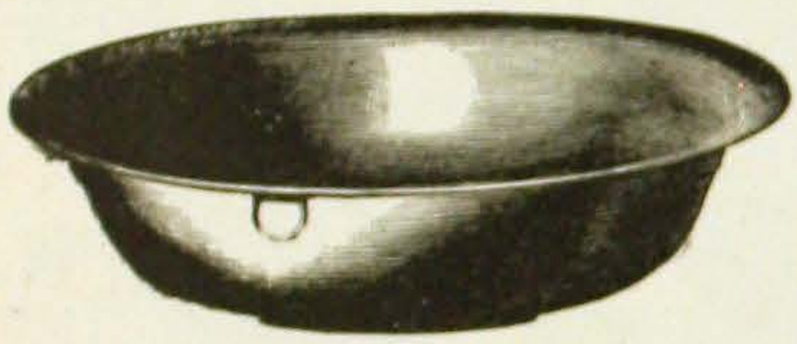
No.	010	020	031	035	040
Inches	9⅝x2¾	10½x3¼	11¼x3½	12x3½	12½x4
Retin'd, feet loose, per doz.					
Retin'd, feet fast, per doz.					

Retinned Strong Wash Bowls—With Rings.

We always send feet loose when not ordered fast.

No.	100	200	300	400
Inches	9⅝x2¾	10⅝x3	11⅜x3⅝	12¾x3⅞
Retinned, feet loose, per doz.				
Retinned, feet fast, per doz.				

RETINNED WASH BASINS—WITH RINGS.



	Light			
No.	**4½**	**5**	**5½**	**6**
Inches . .	7½x1¼	8x2	9x2¼	10x2½
Retinned, I. C., per doz.				

No.	**6½**	**7**	**7½**	**8**
Inches . . .	10½x2¼	11½x2⅜	12¼x3	13x3⅜
Retinned, I. C., per doz.				

	Medium					
No.	**12**	**13**	**14**	**15**	**16**	**17**
Inches .	10x2½	10½x2¾	11½x2⅞	12¼x3	13x3⅛	14x3½
Retinned, I. X., per doz.						

	Strong				
No.	**024**	**026**	**028**	**030**	**032**
Inches .	10x2½	10½x2¾	11½x2⅞	12¼x3⅛	13x3⅜
Retinned, I. XX., per doz.					

No.	**22**	**24**	**26**	**28**
Inches . .	9⅛x2¼	10x2½	10½x2¾	11½x⅜2
Retinned, per doz.				

No.	**30**	**32**	**34**	**36**
Inches . .	12¼x3⅛	13x3⅜	14x3⅝	15x3½
Retinned, per doz.				

	Extra Strong				
No.	**41**	**47**	**53**	**61**	**75**
Inches .	16x4½	18x4¾	20x5	24x6	29½x6½
Retinned, per doz.					



Retinned Round Edge Wash Basins—with Rings.

No.	**35**	**40**	**46**	**52**
Inches . . .	14x3½	16x4	18x4½	20x5
Retinned, per doz.				

Retinned Oval Basins—with Rings.

No.	**213**	**214**	**215**
Inches	13x2¼	14¼x3	15x4⅛
Retinned, per doz.			

RETINNED CULLENDERS.

We always send feet loose when not otherwise ordered.



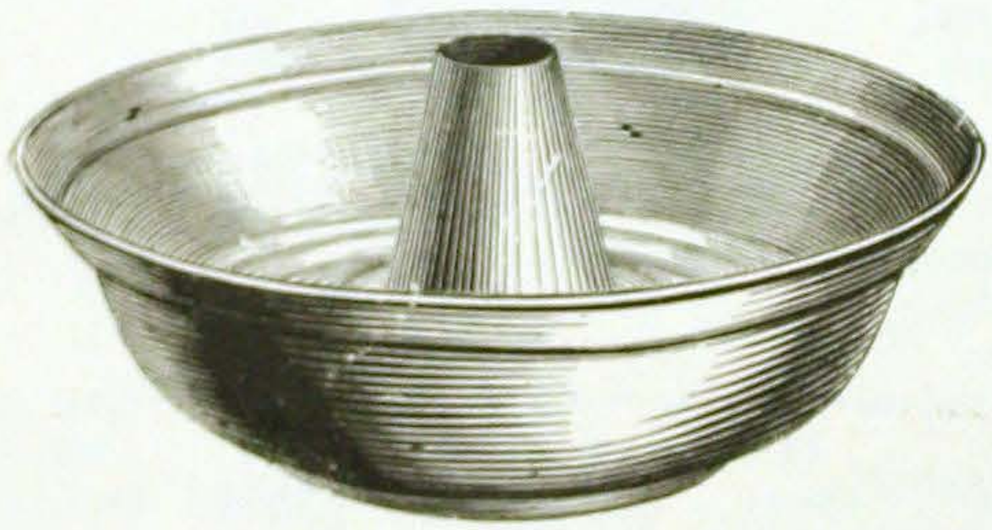
No.	104	205	306	407
Inches . . .	9½x3	10½x3½	11x4	13¼x4½
Retinned, feet loose, per doz.				
Retinned, feet fast, per doz.				

RETINNED CULLENDERS.



No.	10	12	14	16	18
Inches . .	5x2½	6x2¾	6½x3½	7x3¾	8x3¾
Retin'd, per doz.					

No.	20	22	24	26
Inches . .	8½x4¼	9½x4¼	9¾x4½	11x5
Retin'd, per doz.				

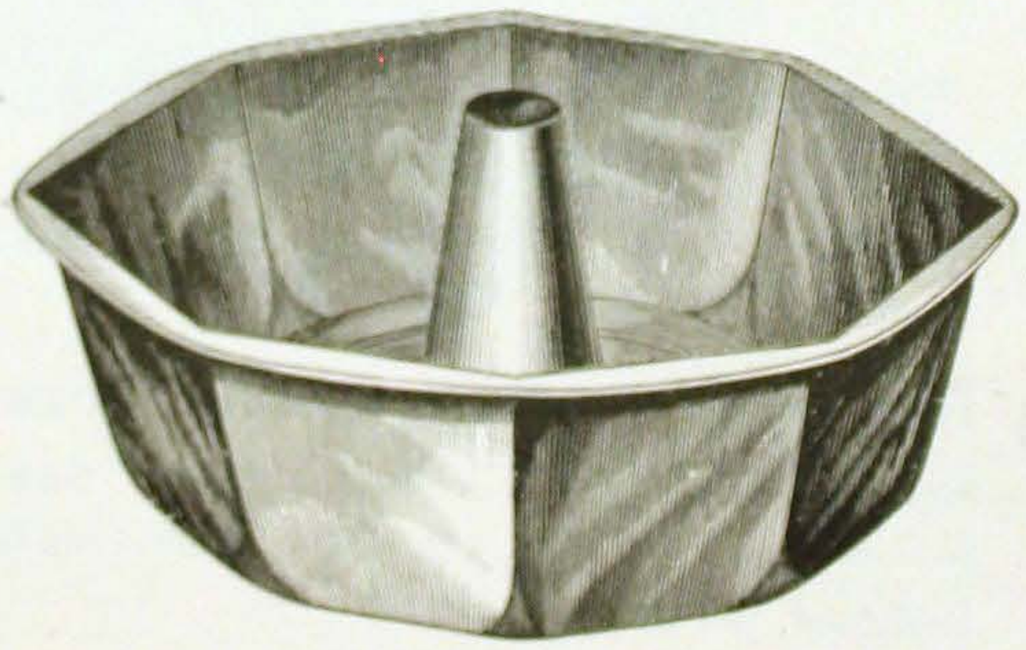


Retinned Tubed Cake Moulds.

No.	52	53	54
Quarts . .	2	3	4
Inches . .	9⅛x2⅝	10x2⅞	10⅜x3⅜
Retin'd, per doz.			

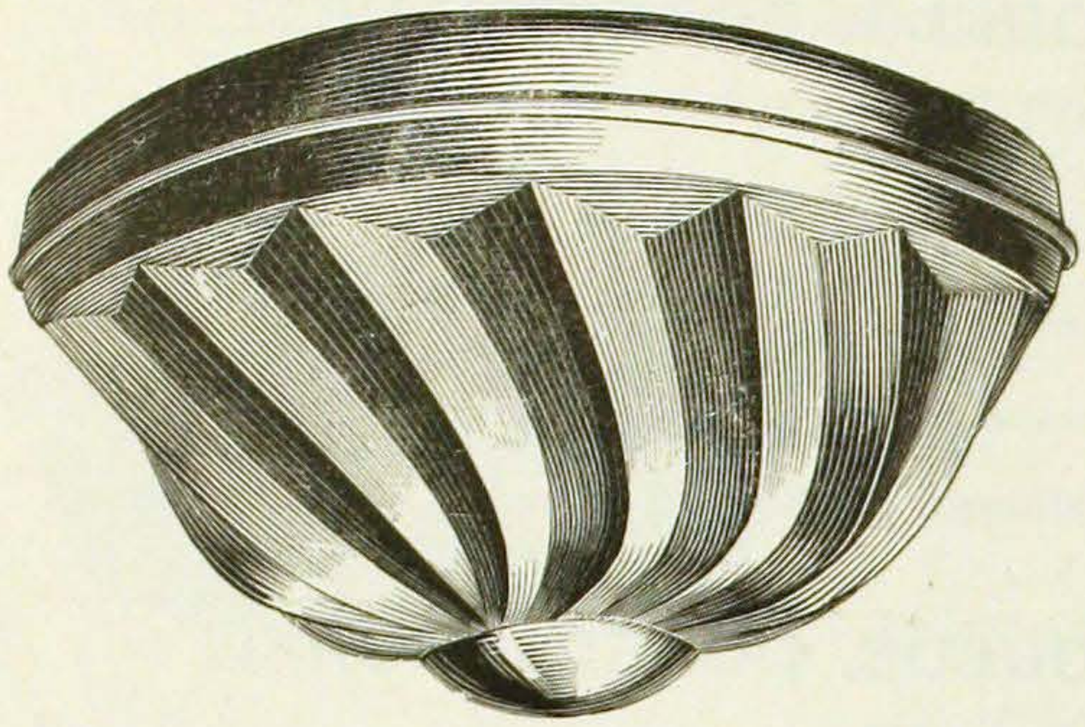
RETINNED OCTAGON CAKE MOULDS.

PATENTED.



No.	72	73	74
Quarts . .	2	3	4
Inches . .	8¼x2⅞	8½x3¼	9¼x3½
Retin'd, per doz.			

No.	75	76
Quarts . .	5	6
Inches . .	10x3⅝	11x3⅞
Retin'd, per doz.		

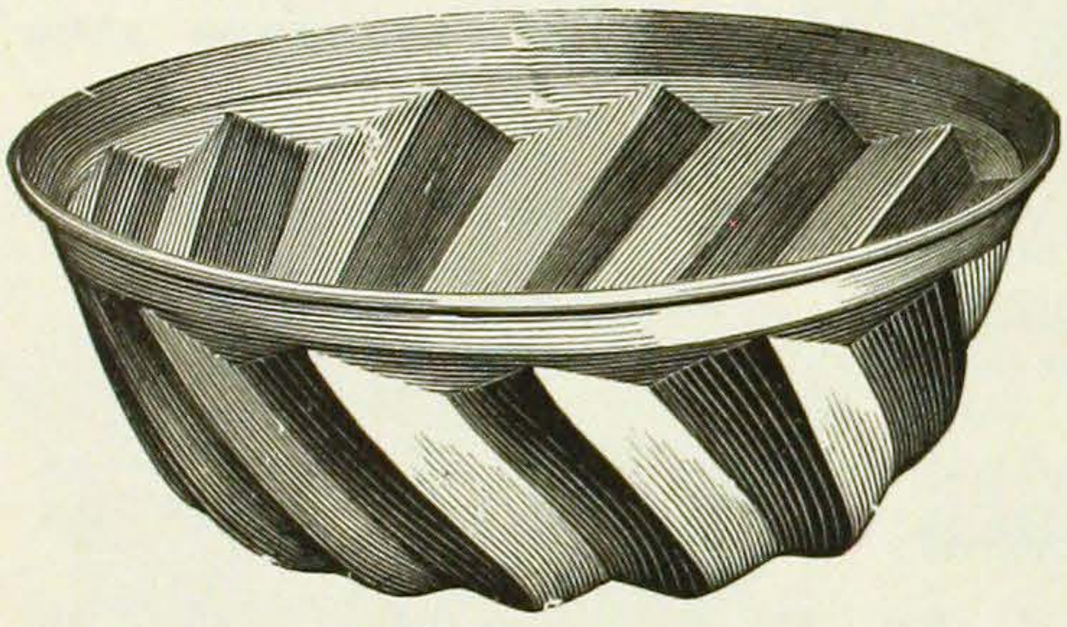


Retinned Pudding Moulds.

PATENTED.

No.	91	92	93
Quarts . . .	2	4	5
Inches . . .	7x4	8⅝x4⅛	9¼x4⅛

Retinned, per doz.

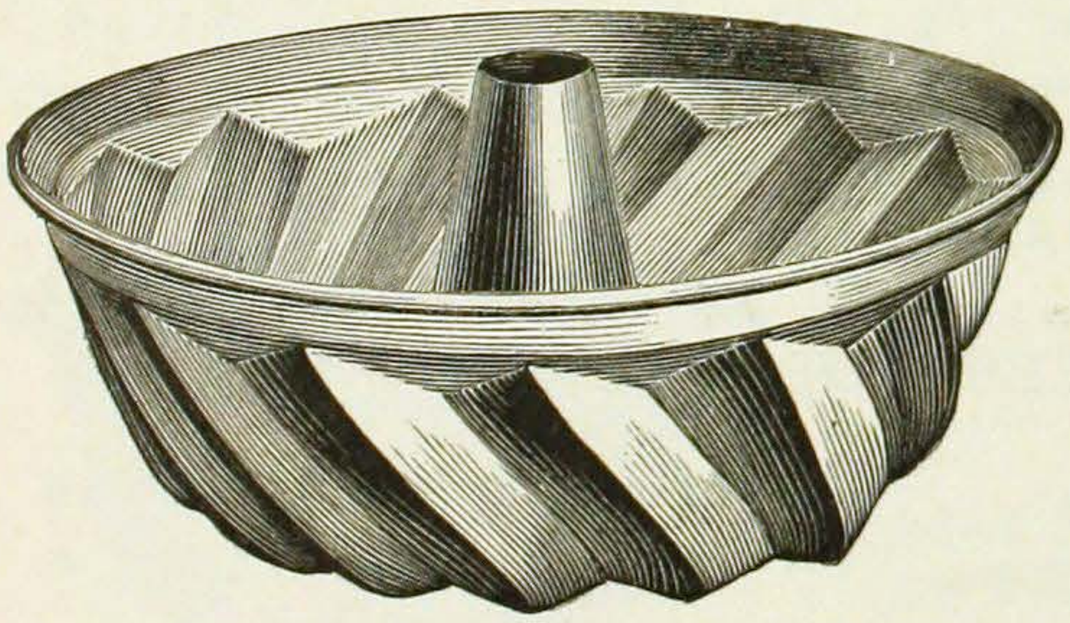


Retinned Jelly Moulds.

PATENTED.

No.	81	82	83
Quarts . . .	2	4	5
Inches . . .	7¼x3⅛	8¾x3⅝	9½x4

Retinned, per doz.

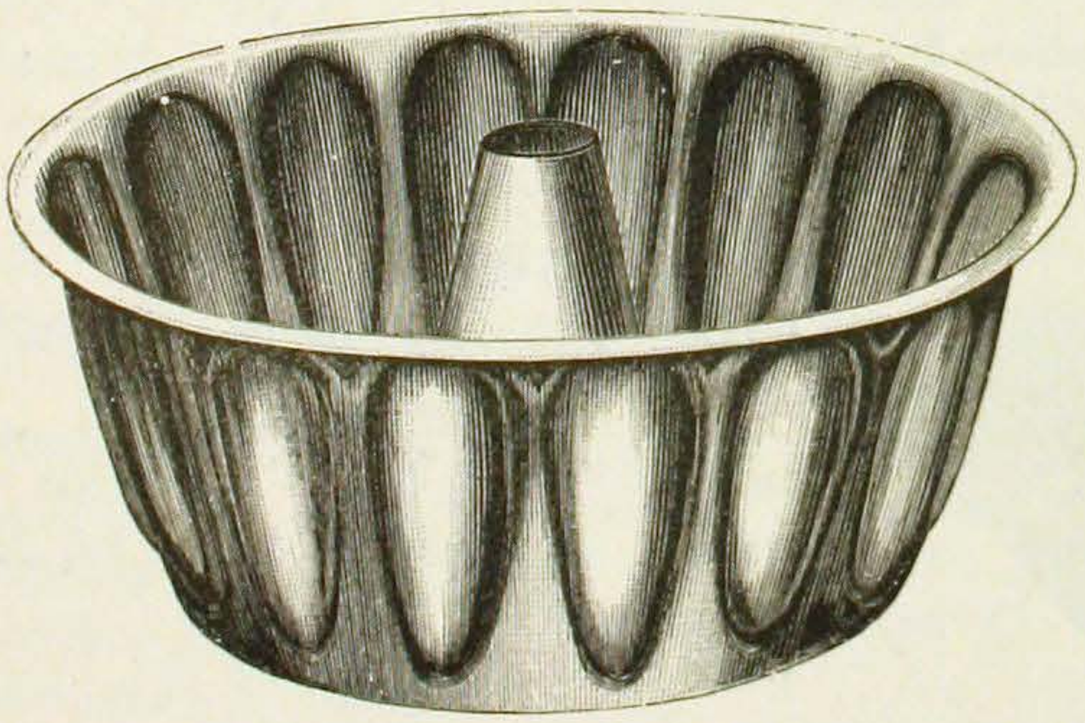


Retinned Turk's Head Cake Moulds.

PATENTED.

No.	61	61½	62	63	64
Quarts,	2	3	4	5	6
Inches,	7¼x3¾	8x3¾	8½x3¾	9½x3⅞	11x4¼

Retin'd, per doz.



Retinned Turban Moulds.

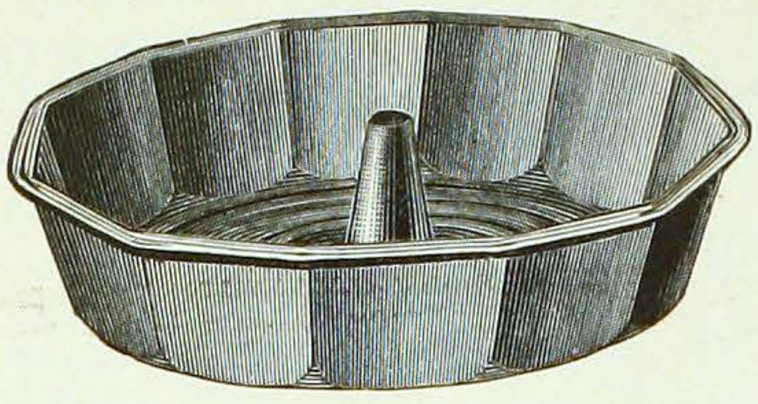
PATENTED.

No.	86	87	88	89
Quarts .	2	4	5	6
Inches .	7⅞x3¼	8¾x3½	9⅜x3¾	10x4

Retinned, per doz.

RETINNED CAKE MOULDS, DODECAHEDRAL.

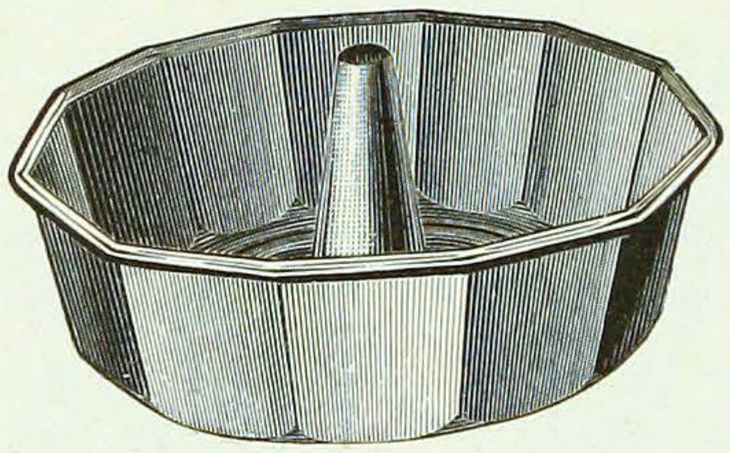
WITH TUBES.



No.	327	347	367
Quarts	2	3	4
Inches	8½x2	9½x3⅜	10¾x2½
Retinned, per doz.			

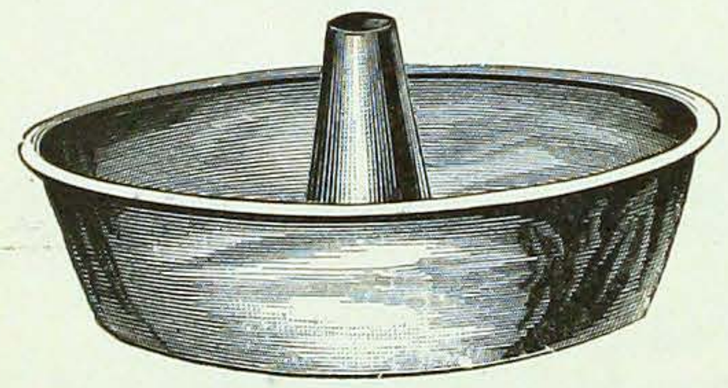
RETINNED CAKE MOULDS, DODECAHEDRAL.

WITH TUBES.



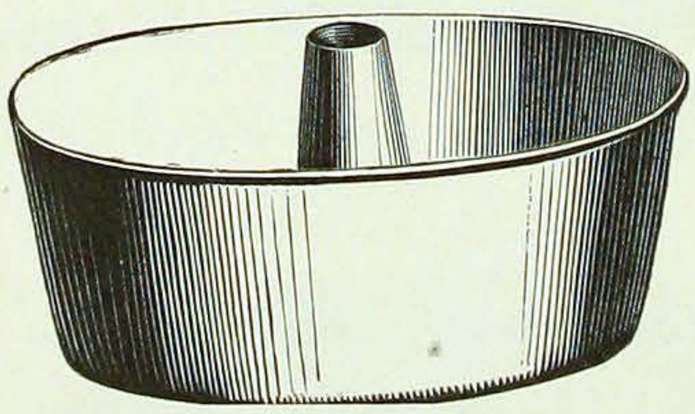
No.	1720	1730	1740	1750	1760
Quarts	2	3	4	5	6
Inches	8½x2⅞	9¼x3⅛	9¾x3¼	10½x3½	11½x3¾
Retinned, per doz.					

RETINNED TUBED CAKE PANS.



No.	31	31½	32	33	34	35	36
Qts.	1	1½	2	3	4	5	6
In.'s,	7¼x1⅞	7¾x2	8½x2	9½x2⅜	10¾x2½	11½x2½	12½2¾
Retin'd, per doz.							

RETINNED EXTRA DEEP TUBED CAKE PANS.



No.	41	42	43	44	45	46
Quarts,	1	2	3	4	5	6
Inches,	6¾x2¾	8½x3	8¾x3¼	9¾x3⅜	10½x3½	11¼3¾
Retinned, per doz.						



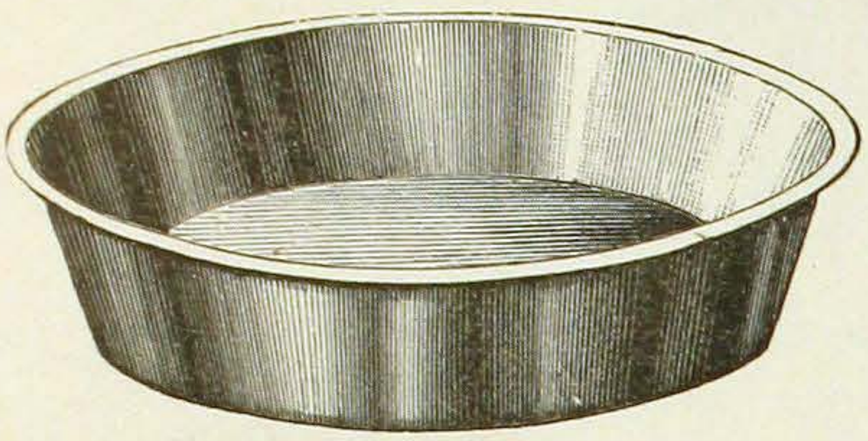
Retinned Flat-Edge Flaring Milk Pans.

EXTRA STRONG.

No.	30	40	50
Inches	13⅜x2½	16x2⅞	18¾x3
Retinned, per doz.			

Retinned Flat-Edge Dairy Pans.

STRAIGHT OR FLARING.



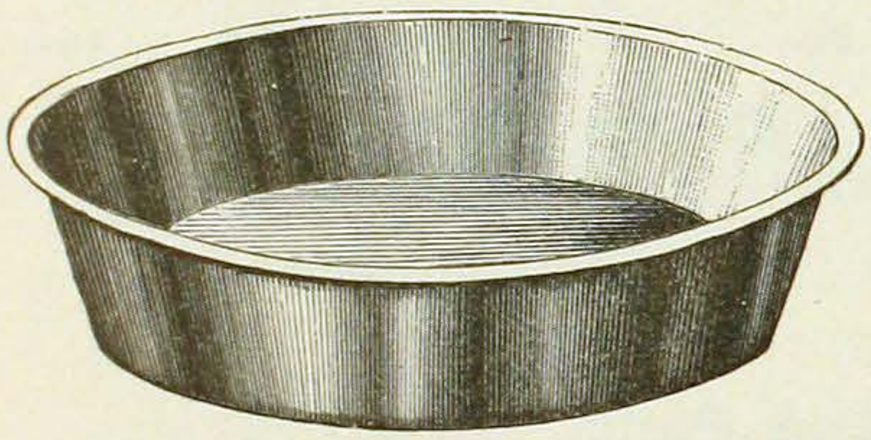
Qts.	¼	½	1	1½	2	3	3½
Ins.	5¼x1⅜	6x1⅜	7x1⅝	7½x1¾	8½x2	9¼x2¼	10x2¼
Retin'd, per doz.							

Qts.	**4**	**5**	**6**	**8**	**10**	**12**
Ins.	10⅝x2½	11⅝x2⅝	12⅝x2¾	13¼x2⅞	14¼x3	15x3⅛
Retin'd, per doz.						

(Straight always sent unless otherwise ordered.)

Retinned Flat-Edge Milk Pans.

STRAIGHT OR FLARING.



	STRONG.			
Qts.	**3**	**3½**	**4**	**5**
Inches . .	9¼x2¼	10x2¼	10⅝x2½	11⅝x2⅝
Retin'd, per doz.				

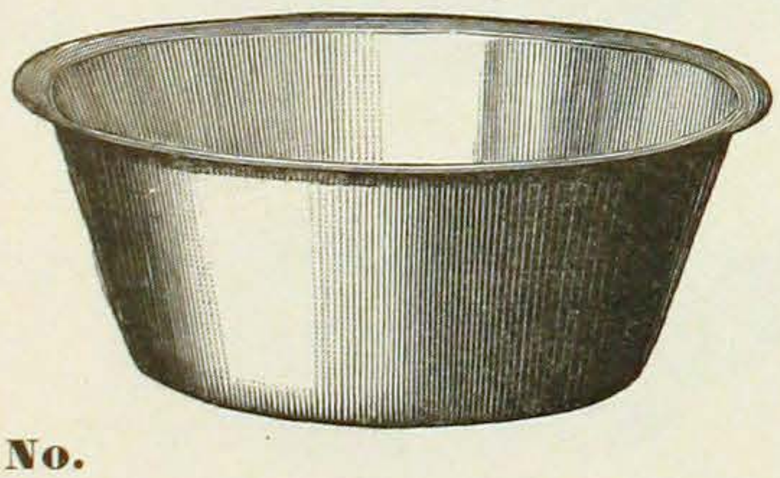
Qts.	**6**	**8**	**10**	**12**
Inches . .	12⅝x2¾	13¼x2⅞	14¼x3	15x3⅛
Retin'd, per doz.				

EXTRA STRONG.

Retin'd, per doz.

(Straight always sent unless otherwise ordered.)

Retinned Extra Deep Flat-Edged Pudding Pans.



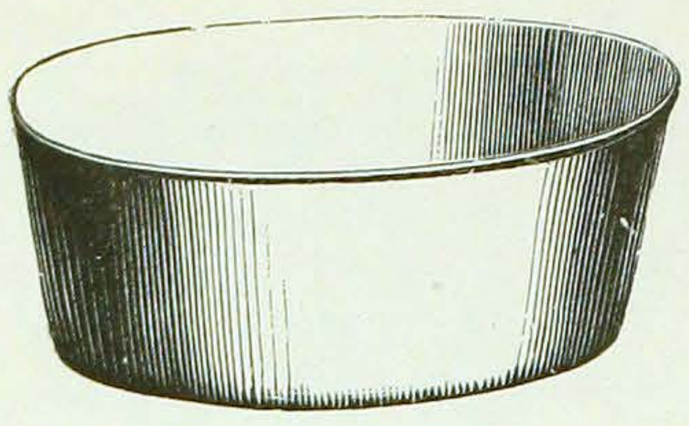
No.	**015**	**016**	**017**	**018**	**019**
Quarts.	½	1	1½	2	3
Inches .	6x2½	6¾x2¾	7½x3	8⅜x3⅛	9¼x3¼
Retinned, I. C., per doz.					

No.	**020**	**021**	**022**	**023**	**024**
Quarts.	4	5	6	8	10
Inches	10x3⅝	10¾x3¾	11⅜x4	12¾x4½	14¼x4¾
Retinned, I. C., per doz.					

No.	**15**	**16**	**17**	**18**	**19**
Quarts.	½	1	1½	2	3
Inches	6x2½	6¾x2¾	7½x3	8⅜x3⅛	9¼x3¼
Retinned, I. X., per doz.					

No.	**20**	**21**	**22**	**23**	**24**
Quarts.	4	5	6	8	10
Inches	10x3⅝	10¾x3¾	11⅜x4	12¾x4½	14¼x4¾
Retinned, I. X., per doz.					

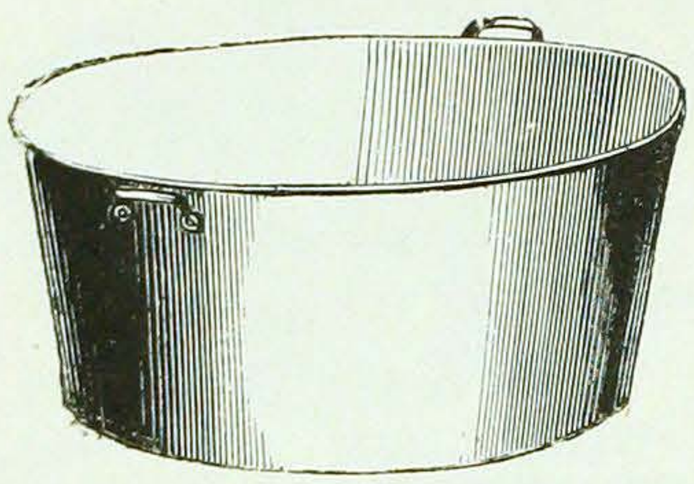
Retinned Extra Deep Strong Beaded Edge Pudding Pans.



Quarts.	½	1	1½	2	3
Inches . .	6¼x2	6¾x2¾	7¼x3	8¼x3	8¾x3¼
Retinned, I. XX., per doz.					

Quarts.	4	5	6	8	10
Inches . .	9½x3¼	10½x3½	11¼x3½	13x4	13¾x4¼
Retinned, I. XX., per doz.					

Retinned Handled Bread Pans.

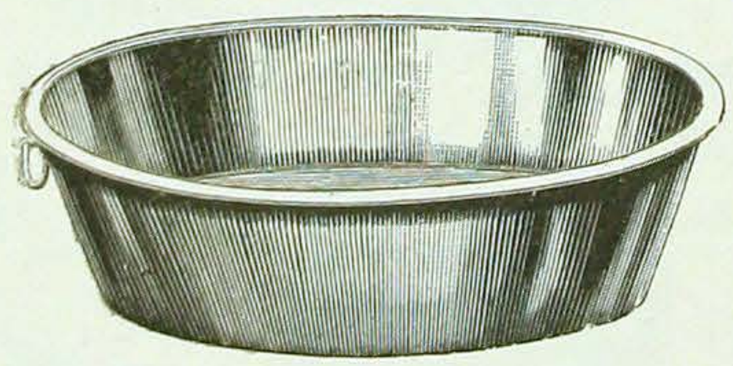


No.	**5**	**10**	**15**	**20**	**30**
Quarts.	½	1	1½	2	3
Inches . .	6¼x2	6¾x2¾	7¼x3	8¼x3	8¾x3¼
Retinned, per doz.					

No.	**40**	**50**	**60**	**80**	**100**
Quarts.	4	5	6	8	10
Inches .	9½x3¼	10½x3½	11¼x3½	13x4	13¾x4¼
Retinned, per doz.					

Retinned Oval Cake Pans.

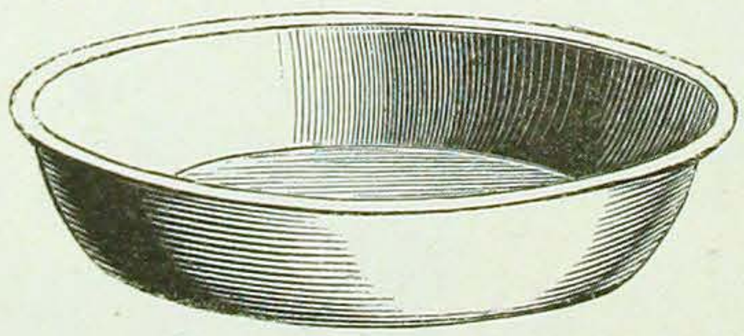
EXTRA DEEP.



Quarts	**1**	**1½**	**2**	**3**
Inches	5½x7½x2¼	6½x8½x2¾	7x9x2⅞	7¼x9¼x3
Retinned, per doz.				

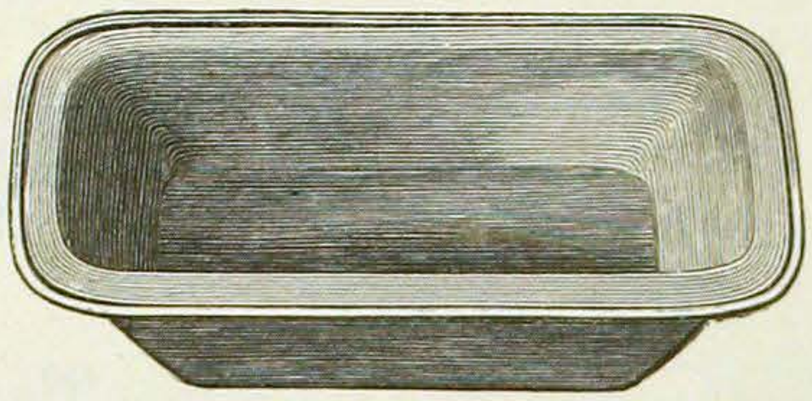
Quarts	**4**	**5**	**6**
Inches	7¾x10½x3⅛	8¼x10¾x3⅜	8⅝x11¾x3½
Retinned, per doz.			

Retinned Oval Flat-Edged Pudding Pans.



No.	**1**	**2**	**3**	**4**	**5**
Inches . .	7¾x10¼x2	8½x11½x2	9½x12¾x2¼	10¼x13½x2½	12½x16½x3
Retinned, per doz.					

Retinned Oblong Flat-Edged Pudding Dishes.



No.	10	11	12	13	14	15
Inches	10¼x7½	11¼x8	12¼x8	13x9⅜	14x10	15x10¾
Retinned, per doz.						



Retinned Oval Shirred Egg Plates.

No.	1
Inches	4⅛x5¾x1
Retinned, per doz.	



Retinned Round Bottom Dinner Plates.

	Strong.	Extra Strong.
No.	**23**	**24**
Inches	9x1	9x1
Retinned, per doz.		



Retinned Round Bottom Soup Plates.

No.	40
Inches	10½x1½
Retinned, per doz.	



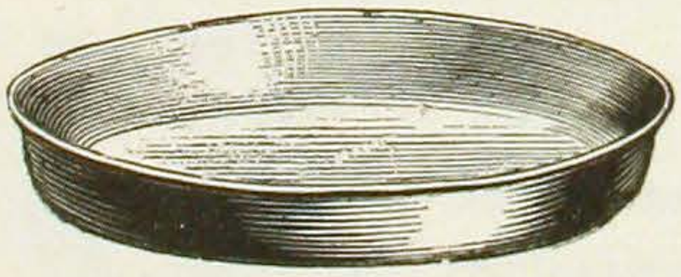
Retinned Flat Bottom Dinner Plates.

No.	30
Inches	9¼x1
Retinned, per doz.	



Retinned Flat Bottom Soup Plates.

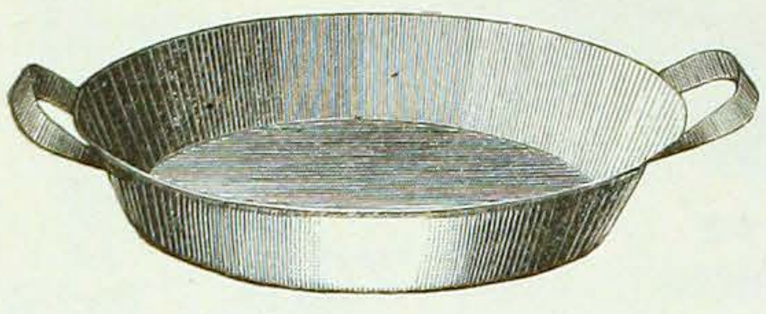
No.	35
Inches	9¾x1½
Retinned, per doz.	



Retinned Beaded Soup Plates.

No.	20
Inches	9x1½
Retinned per doz.	

Retinned Egg Plates.

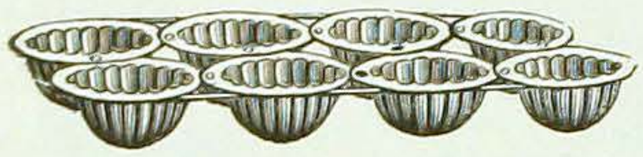


NEW PATTERN.

No.	00	10	20	30	40
Inches .	4¼x1	5⅛x1⅛	6⅛x1⅛	7⅛x1⅛	8x1⅜
Retinned, per doz.					

No.	50	60	70	80	90
Inches	8¾x1⅜	9½x1½	10½x1¾	11¼x2	12¼x2¼
Retin'd, per doz.					

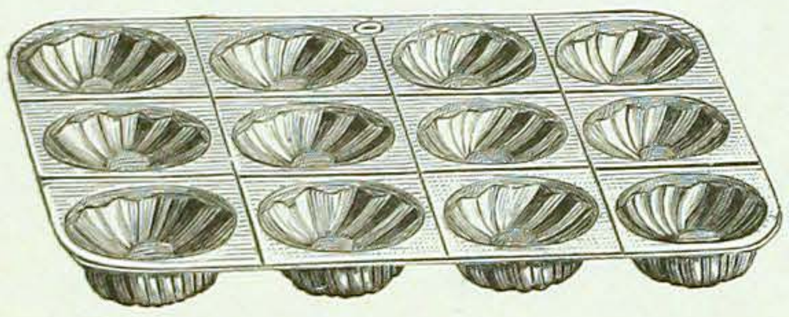
Retinned Patent Cookey Pans.



	8 cups to the frame.	12 cups to the frame.
No.	9	9½
Retinned, per doz.		

Retinned "Gotham" Turks' Head Muffin Pans.

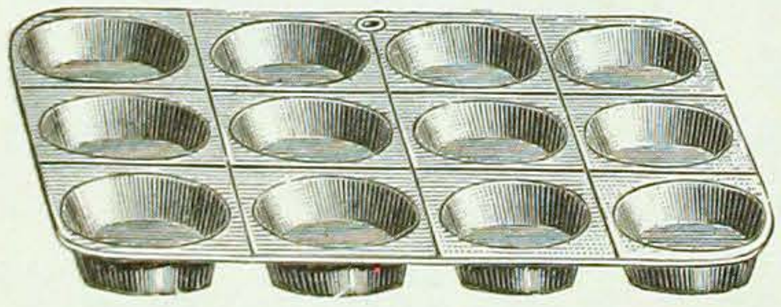
PATENTED.



No.	1506	1508	1512
Cups on frame . .	6	8	12
Retinned, per doz. Frames			

Retinned "Gotham" Muffin Pans.

PATENTED

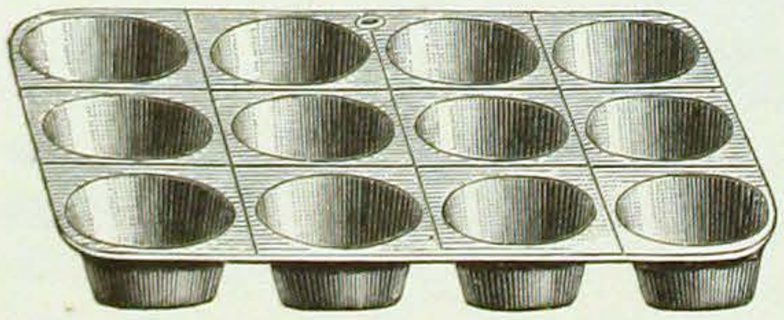


	MEDIUM SIZE CUPS.		
No.	406	408	412
Cups on frame . . .	6	8	12
Retinned, per doz. frames			

	LARGE SIZE CUPS.		
No.	506	508	512
Cups on frame . . .	6	8	12
Retinned, per doz. frames			

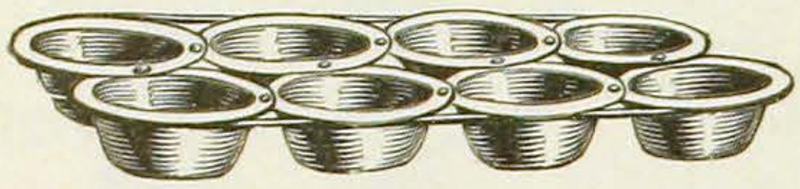
Retinned "Gotham" Corn-Cake Pans.

PATENTED



No.	706	708	712
Cups on frame	6	8	12
Retinned, per doz. frames			

Retinned Patent Biscuit Pans.



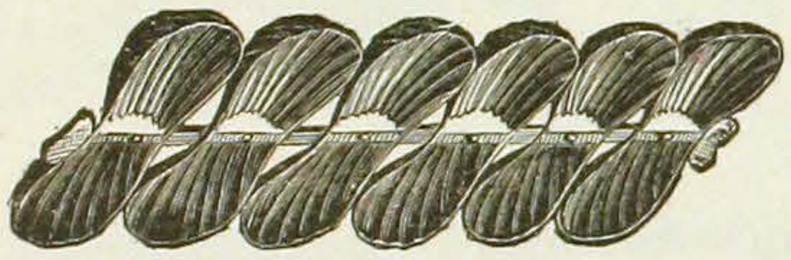
	Medium Size Cups. 8 cups to the frame.		Large Size Cups. 12 cups to the frame.	
No.	**0**	**1**	**0½**	**1½**
Retinned, per doz. frames				

Retinned Patent Oval Vienna Bakers.



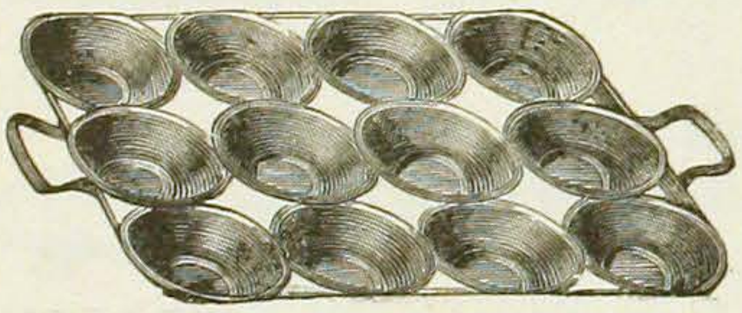
	6 cups to the frame.	9 cups to the frame.
No.	**08**	**08½**
Retinned, per doz. frames		

Retinned Patent "Pearl" Bakers.



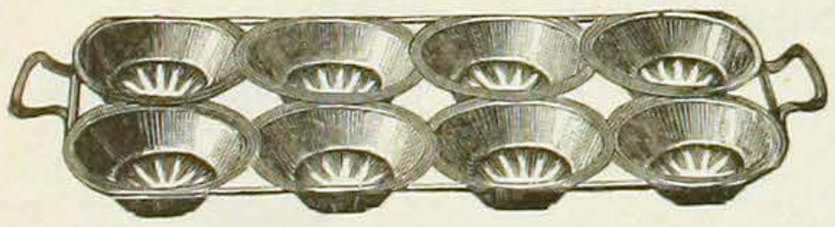
	12 cups to the frame.
No.	**12½**
Retinned, per doz. frames	

Retinned Patent Round "Vienna" Bakers.



	12 cups to the frame
No.	**09½**
Retinned, per doz. frames	

Retinned Patent Round "Vienna" Bakers.

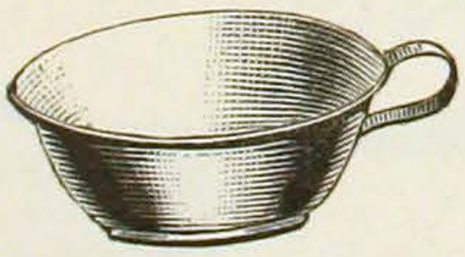


	8 cups to the frame.	12 cups to the frame.
No.	**10**	**10½**
Retinned, per doz. frames		

Retinned Toy Cups and Saucers.

No.	**00**
Retinned, per doz. Sets	

Retinned Cups.



No.	**0½**	**1½**	**2½**
Pints	½	1	2
Inches	4⅛x1⅞	4¾x2⅛	5⅜x2½
Retinned, per doz.			



Retinned California Cups.

No.	2	4
Pints	1	2
Inches	$4\frac{3}{4}$x$2\frac{1}{8}$	$5\frac{3}{8}$x$2\frac{1}{2}$
Retinned, per doz.		



Retinned Straight Drinking Cups.

No.	14	15	16	17
Inches	$3\frac{1}{2}$x2	$3\frac{3}{4}$x$2\frac{3}{8}$	4x$2\frac{3}{4}$	$4\frac{3}{8}$x$2\frac{5}{8}$
Retinned, per doz.				



Retinned Drinking Cups.

No.	08	09	010	011
Inches	4x$1\frac{7}{8}$	$4\frac{1}{8}$x$2\frac{1}{8}$	$4\frac{1}{2}$x$2\frac{1}{8}$	$4\frac{3}{4}$x$2\frac{3}{8}$
Retinned, per doz.				

No.	7	8	9	10	11
Inches	$3\frac{1}{8}$x$1\frac{1}{2}$	$3\frac{7}{8}$x2	$4\frac{1}{8}$x$2\frac{1}{4}$	$4\frac{1}{2}$x$2\frac{1}{4}$	5x$2\frac{1}{2}$
Retinned, per doz.					



Retinned Saucers.

No.	00	0	1	$1\frac{1}{2}$	2	3
						DEEP.
Inches	$4\frac{1}{8}$x$\frac{5}{8}$	5x$\frac{5}{8}$	$5\frac{3}{4}$x$\frac{3}{4}$	$6\frac{1}{8}$x$\frac{7}{8}$	$6\frac{3}{4}$x1	6x$1\frac{1}{4}$
Retinned, per doz.						

Retinned Tortumas.

ARMY DRINKING CUP.



No.	25
Inches	$4\frac{3}{4}$x$3\frac{1}{2}$x$1\frac{1}{2}$
Retinned, per doz.	

Retinned Seamless Tumblers.



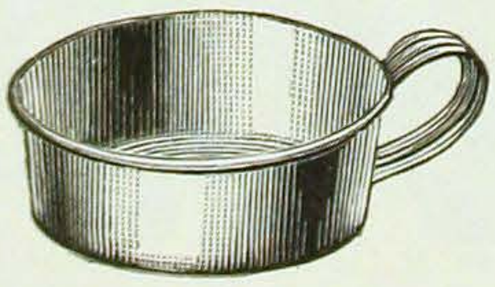
No.	6	7
Pints	$\frac{1}{2}$	1
Inches	3x3	$3\frac{1}{2}$x$4\frac{1}{4}$
Retinned, per doz.		

Retinned Children's Mugs.



No.	3	5	18
Pints	$\frac{1}{2}$	1	$1\frac{1}{2}$
Inches	3x3	$3\frac{1}{2}$x4	$4\frac{1}{2}$x4
Retinned, per doz.			

Retinned Teamster's Cups.



No.	23
Inches	$4\frac{3}{4}$x$2\frac{1}{4}$
Retinned, per doz.	



Retinned Miner's Cups.

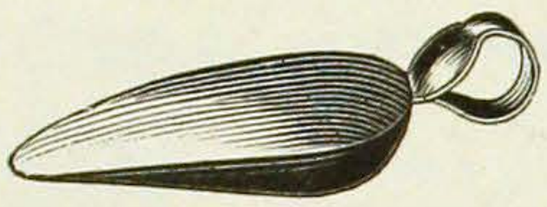
No.	**100**	**200**
Quart	1	1½
Inches	5x3¾	6x5⅜
Retinned, per doz.		

Retinned Confectioners' Scoops.



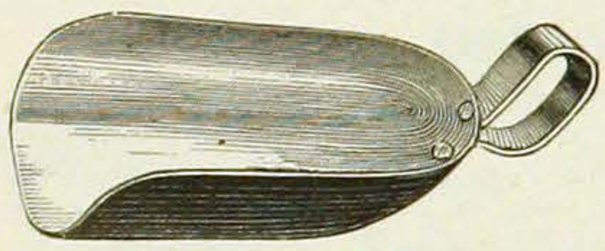
No.	**21**	**22**	**23**
Inches	2½x4½	2⅝x4¾	3x5¾
Retinned, per doz.			

Retinned Thumb Scoops.



No.	**12**	**14**	**16**
Inches	2¾x5¼	3¼x6	4x7⅜
Retinned, per doz.			

Retinned Spice Scoops.



No.	**0**	**00**	**000**
Inches	2½x3½	3¼x4½	3¾x5¼
Retinned, per doz.			

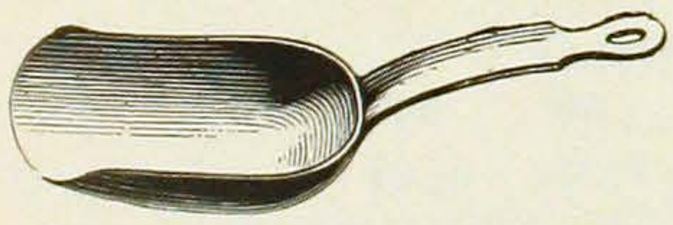
Retinned Tea Scoops.



No.	**13**	**15**	**17**
Inches	2¾x5¼	3¼x6	4x7¾
Retinned, per doz.			

Retinned Family Scoops.

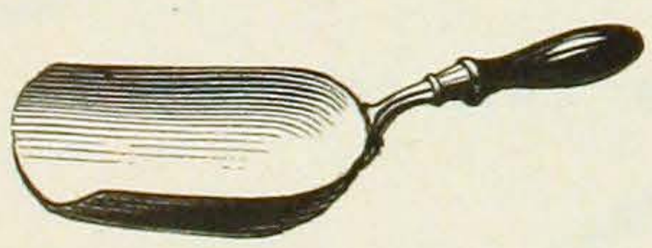
FLAT HANDLED.



No.	**34**	**35**	**36**
Inches	3½x5	3¾x5¾	4x6¼
Retinned, per doz.			

Retinned Family Scoops.

WOOD HANDLED.



No.	**37**	**38**	**39**
Inches	3½x5	3¾x5¾	4x6¼
Retinned, per doz.			

Retinned Candy Scoops.

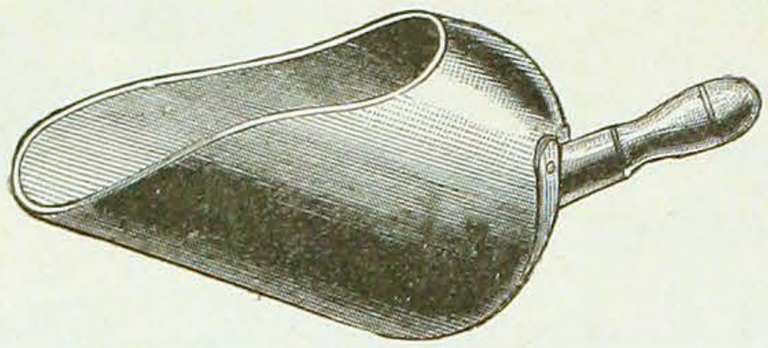
WOOD HANDLED.



No.	**24**
Inches	2¾x3½
Retinned, per doz.	

Retinned Solid Steel, Seamless Scoops—Patented.

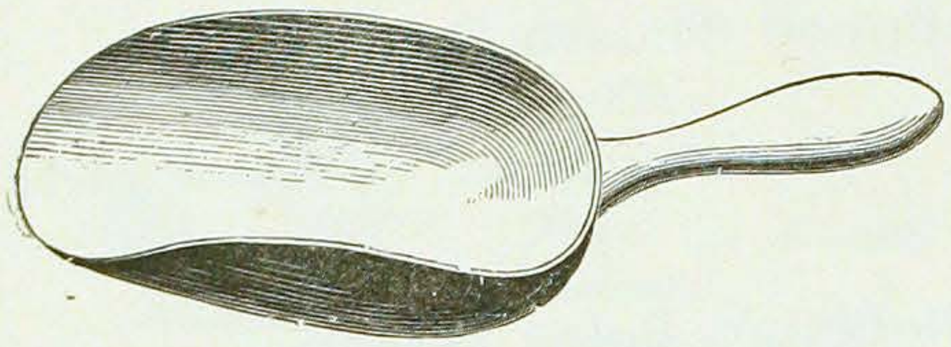
WOOD HANDLED.



No.	163	164	165	166	167
Inches .	7¼x4½	8x5¼	9½x6	10½x7	11x8
Retinned, per doz.					

Retinned Grocers' Scoops—Patented.

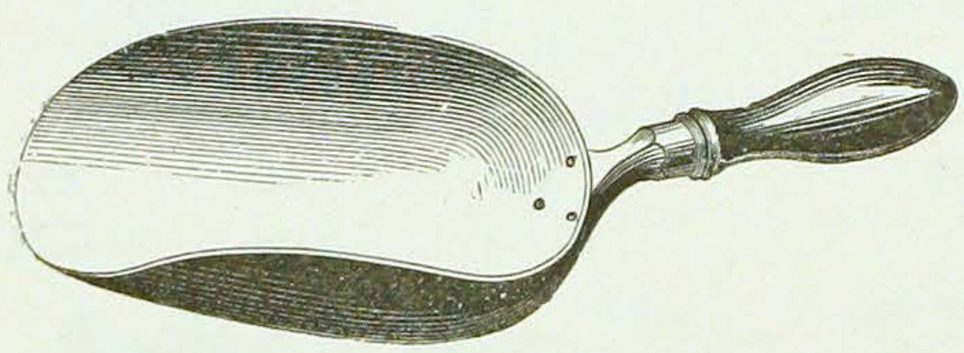
METAL HANDLED.



No.	2	3	4	5
Inches .	4¾x6¾	5½x8	6½x9¾	7¾x11
Retinned, per doz.				

Retinned Grocers' Scoops—Patented.

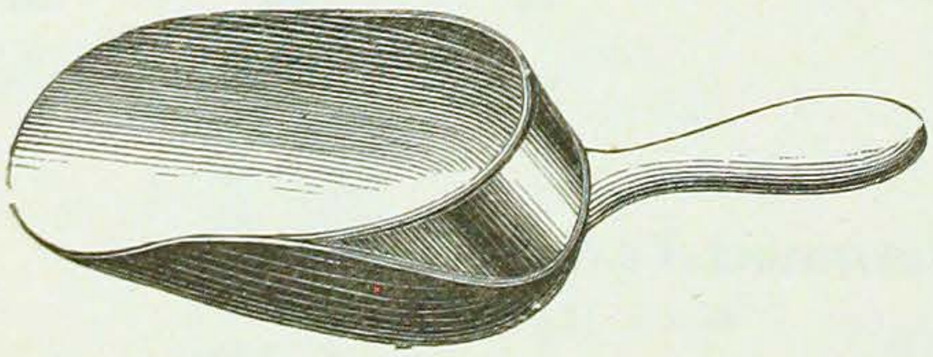
WOOD HANDLED.



No.	7	8	9	10
Inches .	4¾x6¾	5½x8	6½x9¾	7¾x11
Retinned, per doz.				

Retinned Covered Grocers' Scoops—Patented.

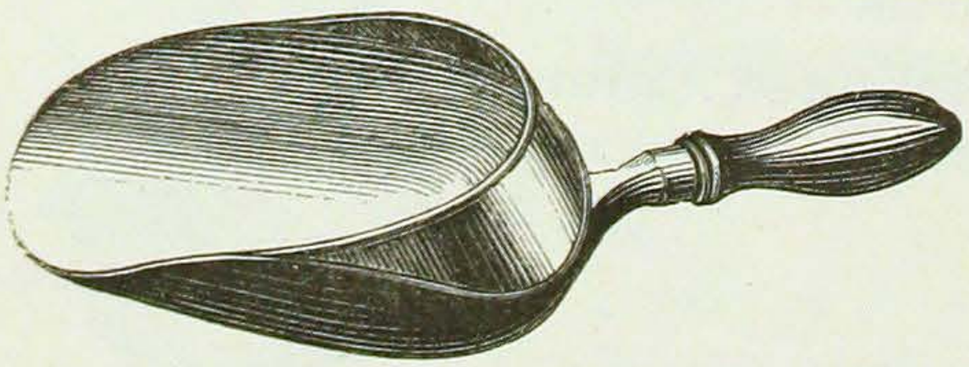
METAL HANDLED.



No.	20	30	40	50
Inches .	4¾x6¾	5½x8	6½x9¾	7¾x11
Retinned, per doz.				

Retinned Covered Grocers' Scoops—Patented.

WOOD HANDLED.



No.	70	80	90	100
Inches .	4¾x6¾	5½x8	6½x9¾	7¾x11
Retinned, per doz.				

Retinned "Pearl" Muffin Cups.



No.	**12**
Inches	$3\frac{3}{4}$x2
Retinned, per doz.	

Retinned Turk's Head Muffin Cups.



No.	**21**	**22**
Inches	$3\frac{1}{4}$x$1\frac{1}{4}$	$3\frac{3}{4}$x$1\frac{1}{2}$
Retinned, per doz.		

Retinned Muffin Cups.



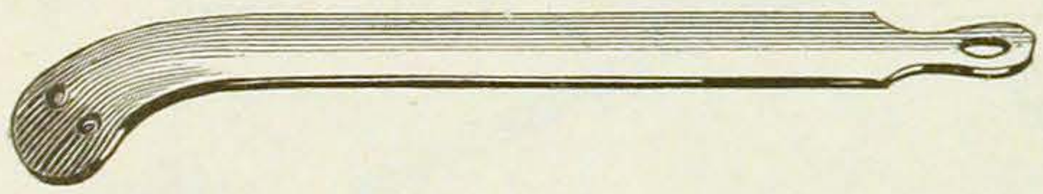
	Extra Deep.
No.	**07**
Inches	3x$1\frac{5}{8}$
Retinned, per doz.	

Retinned Muffin Cups.



No.	**04**	**05**	**08**
Inches	3x1	$3\frac{1}{2}$x$1\frac{1}{8}$	4x$1\frac{5}{8}$
Retinned, per doz.			

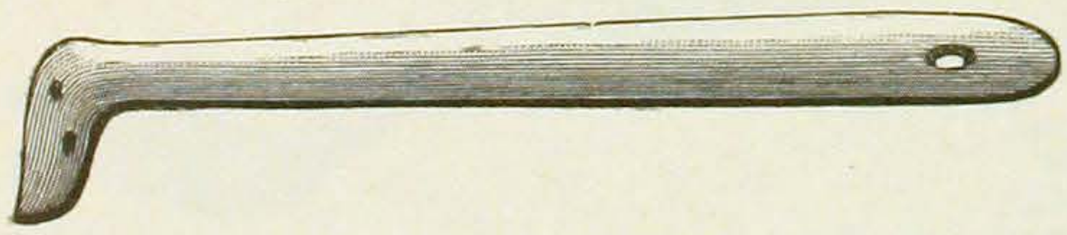
Retinned Saucepan Handles.



No.	**1**	**2**	**3**	**4**	**5**	**6**
Inches	$5\frac{3}{4}$	$6\frac{5}{8}$	8	$8\frac{3}{4}$	$10\frac{1}{2}$	$11\frac{3}{8}$
Retinned, per doz.						

Retinned Saucepan Handles.

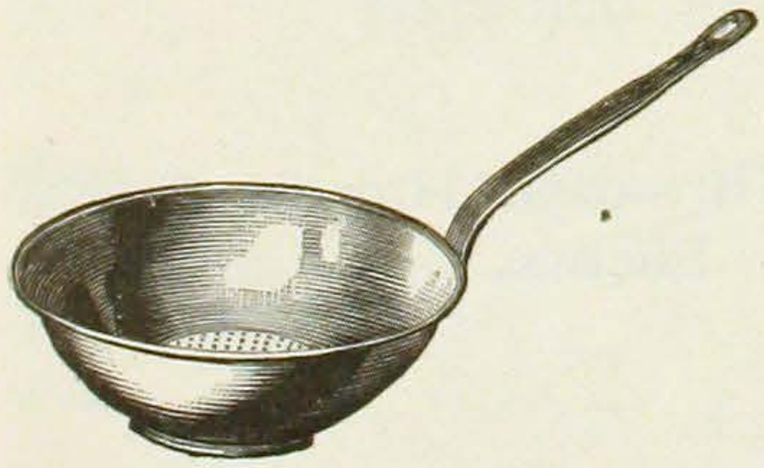
New Pattern.



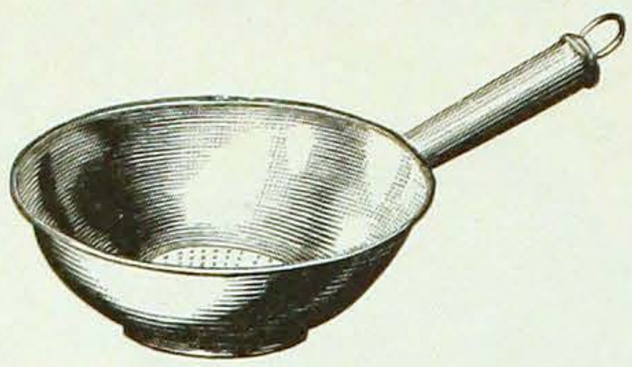
No.	**10**	**20**	**30**	**40**	**50**
Inches	6	7	8	9	10
Retinned, per doz.					

Retinned Gravy Strainers.

With Seamless Foot.



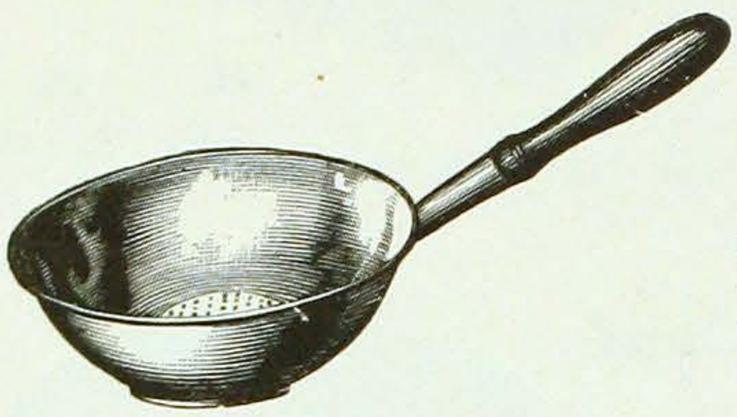
No.	**15**	**16**	**17**	**18**	**19**
Inches	$3\frac{3}{4}$x$1\frac{1}{4}$	$4\frac{3}{8}$x$1\frac{5}{8}$	$5\frac{1}{8}$x2	6x$2\frac{1}{8}$	$6\frac{7}{8}$x$2\frac{1}{4}$
Retin'd, per doz.					



Retinned Gravy Strainers.

WITH PATENT SEAMLESS FOOT.

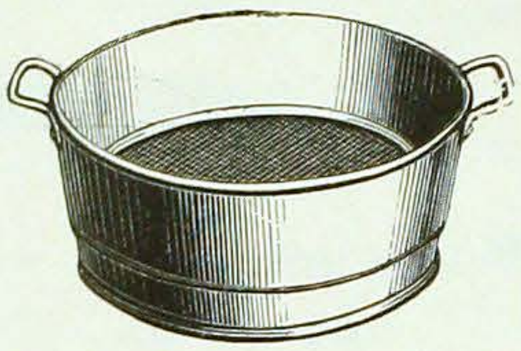
No.	35	36	37	38	39
Inches	$3\frac{3}{4}$x$1\frac{1}{4}$	$4\frac{3}{8}$x$1\frac{5}{8}$	$5\frac{1}{8}$x2	6x$2\frac{1}{8}$	$6\frac{7}{8}$x$2\frac{1}{4}$
Retin'd, per doz.					



Retinned Wood-Handled Gravy Strainers.

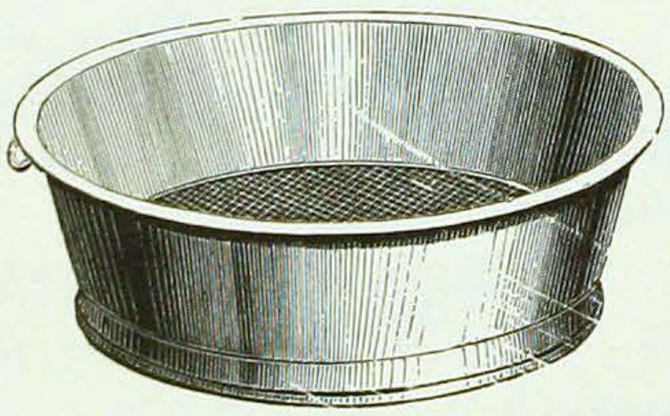
WITH PATENT SEAMLESS FOOT.

No.	25	26	27	28	29
Inches	$3\frac{3}{4}$x$1\frac{1}{4}$	$4\frac{3}{8}$x$1\frac{5}{8}$	$5\frac{1}{8}$x2	6x$2\frac{1}{8}$	$6\frac{7}{8}$x$2\frac{1}{4}$
Retin'd, per doz.					



Retinned Jelly Sieves.

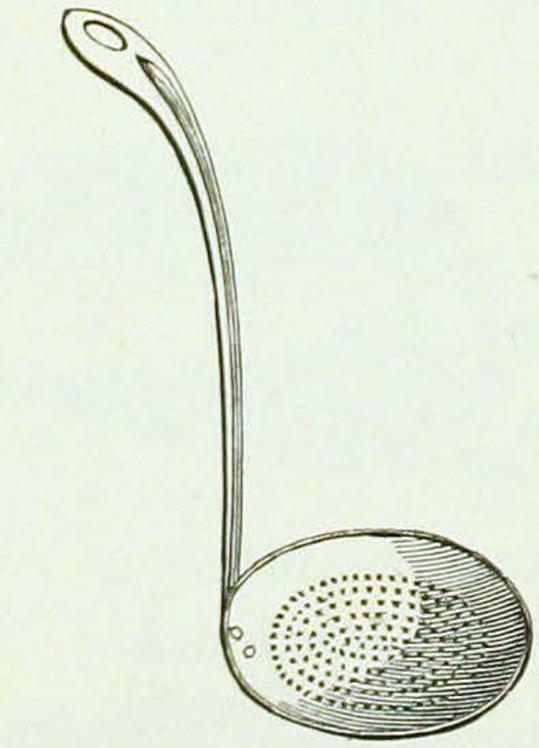
No.	16	20	24
Inches	$6\frac{3}{4}$x$3\frac{1}{2}$	$8\frac{1}{2}$x$3\frac{3}{4}$	$9\frac{3}{4}$x$4\frac{1}{4}$
With Brass Wire Cloth, per doz.			
With French Tinned Wire Cloth per doz.			



Retinned Flour Sieves.

TINNED WIRE CLOTH.

No.	1	2	4	6	8
Inches	7x$2\frac{1}{2}$	$8\frac{1}{2}$x$2\frac{3}{4}$	$10\frac{1}{2}$x$3\frac{1}{2}$	$12\frac{1}{2}$x$3\frac{3}{4}$	14x4
Retinned, per doz.					



Retinned Threaded Handle Egg Poachers.

No.	1
Inches	$4\frac{1}{4}$
Retinned, per doz.	



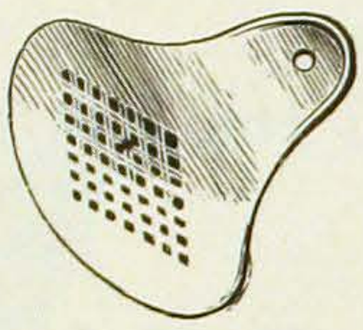
Retinned Threaded Handle Egg Slicers.

No.	25
Inches	3x$3\frac{1}{2}$
Retinned, per doz.	



Retinned Egg Whips.

Retinned Handles, per gross .
Wood Handles, per gross . .



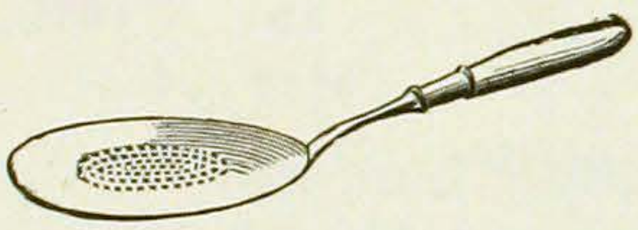
Retinned Milk Skimmers.

	Plain.	Pierced.
No.	**30**	**35**
Inches . . .	$5\frac{3}{8}$x5	$5\frac{3}{8}$x5
Retinned, per gross		



Retinned Threaded Handle Milk Skimmers.

	Plain.	Pierced.
No.	**50**	**55**
Inches	4	4
Retinned, per doz. . .		



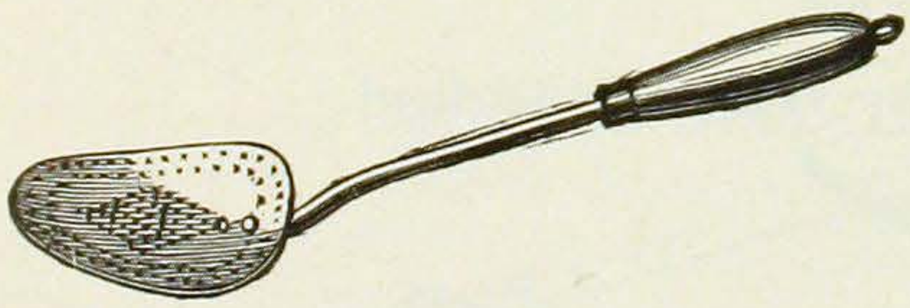
Retinned Milk Skimmers—Wood Handled.

	Plain.	Pierced.
No.	**40**	**45**
Inches	4	4



Retinned Milk Skimmers—Cairns' Pattern.

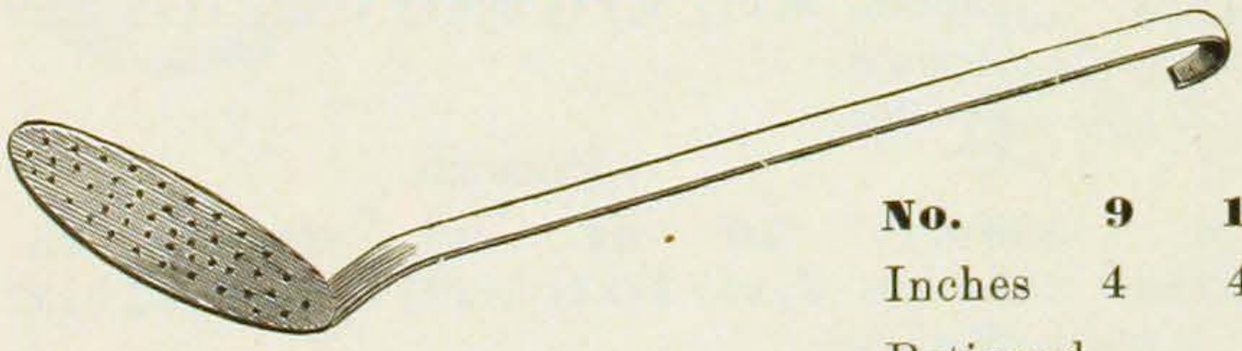
No.	**50**
Inches	$4\frac{1}{8}$x$\frac{7}{8}$
Retinned, per doz.	



Retinned Preserve Skimmers—Wood Handled.

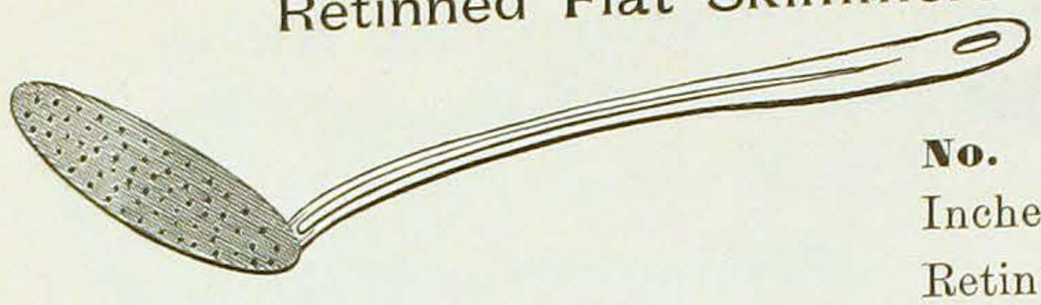
No.	**1**
Inches	3x$4\frac{1}{2}$
Retinned, per doz.	

Retinned Flat Skimmers—Flat Handled.



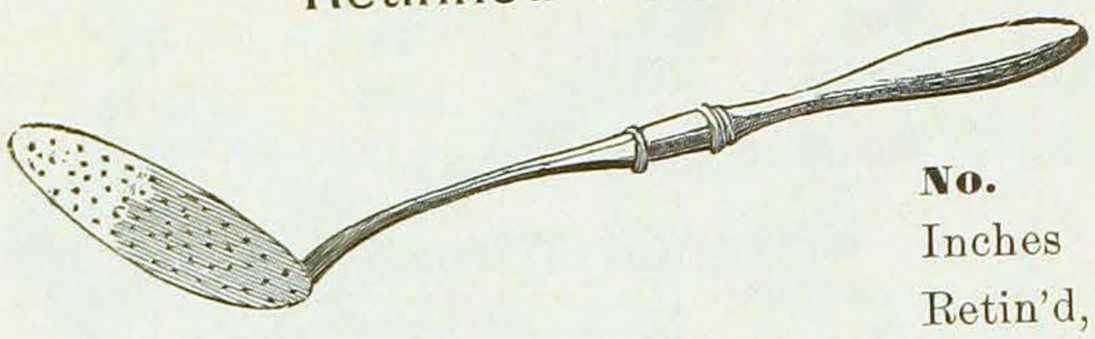
No.	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Inches	4	$4\frac{3}{8}$	$4\frac{3}{4}$	5	$5\frac{3}{8}$	$5\frac{3}{4}$	$6\frac{1}{4}$
Retinned, per doz.							

Retinned Flat Skimmers—Threaded Handle.



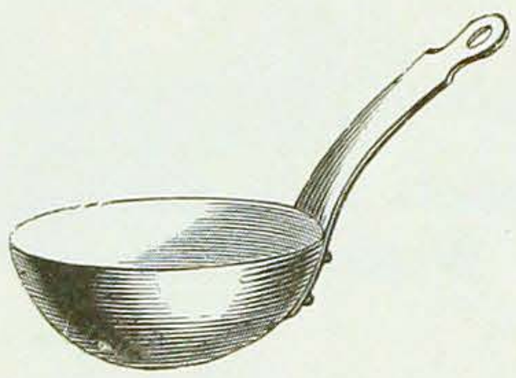
No.	16	17	18	19	20	21
Inches .	4⅜	4¾	5	5⅜	5¾	6¼
Retin'd, per doz.						

Retinned Flat Skimmers—Wood Handled.



No.	22	23	24	25	26	27
Inches .	4⅜	4¾	5	5⅜	5¾	6¼
Retin'd, per doz.						

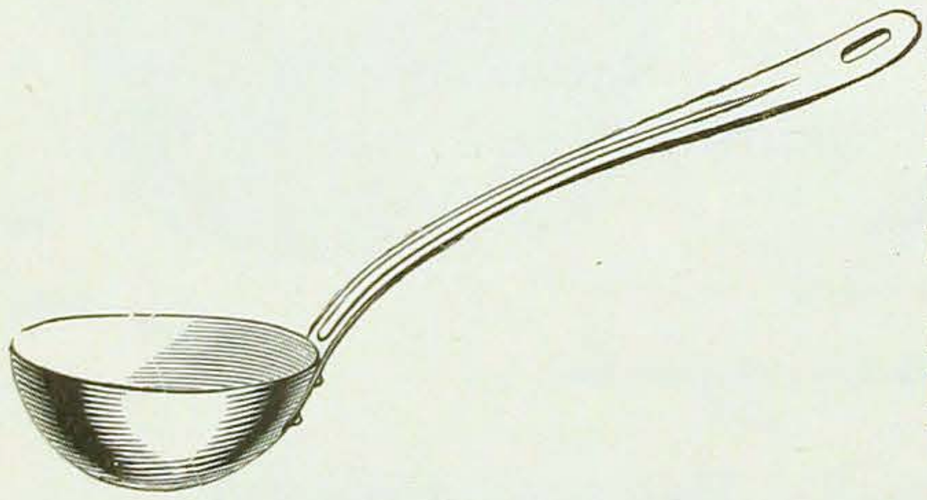
Retinned Pump Ladles.



	Light			
No.	10	11	12	13
Inches .	3⅞x1¾	4⅜x1¾	4½x2	5⅛x2
Retin'd, per doz.				

	Strong.	Extra Strong.
No.	13	10	11
Inches . .	5¼x2	4¼x1½	4½x1¾
Retinned. per doz.			

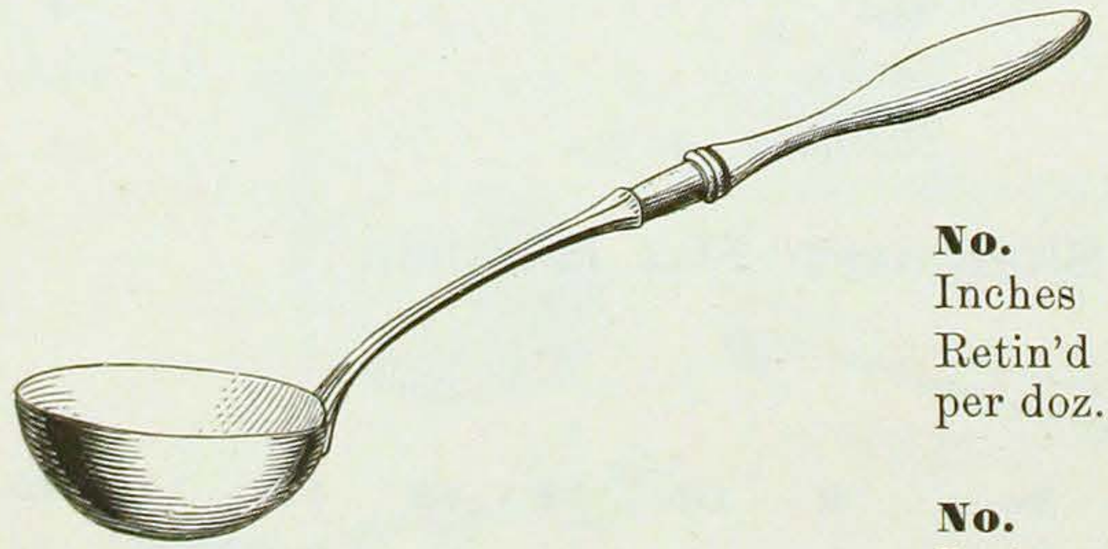
Retinned Deep Ladles—Threaded Handle.



	Plain					
No.	14	15	16	17	18	19
Inches	3½x1⅜	3⅝x1½	3⅞x1⅝	4⅜x1¾	4¾x2	5⅛x2
Retin'd per doz.						

	Pierced.					
No.	14	15	16	17	18	19
Inches	3½x1⅜	3⅝x1½	3⅞x1⅝	4⅜x1¾	4¾x2	5⅛x2
Retin'd per doz.						

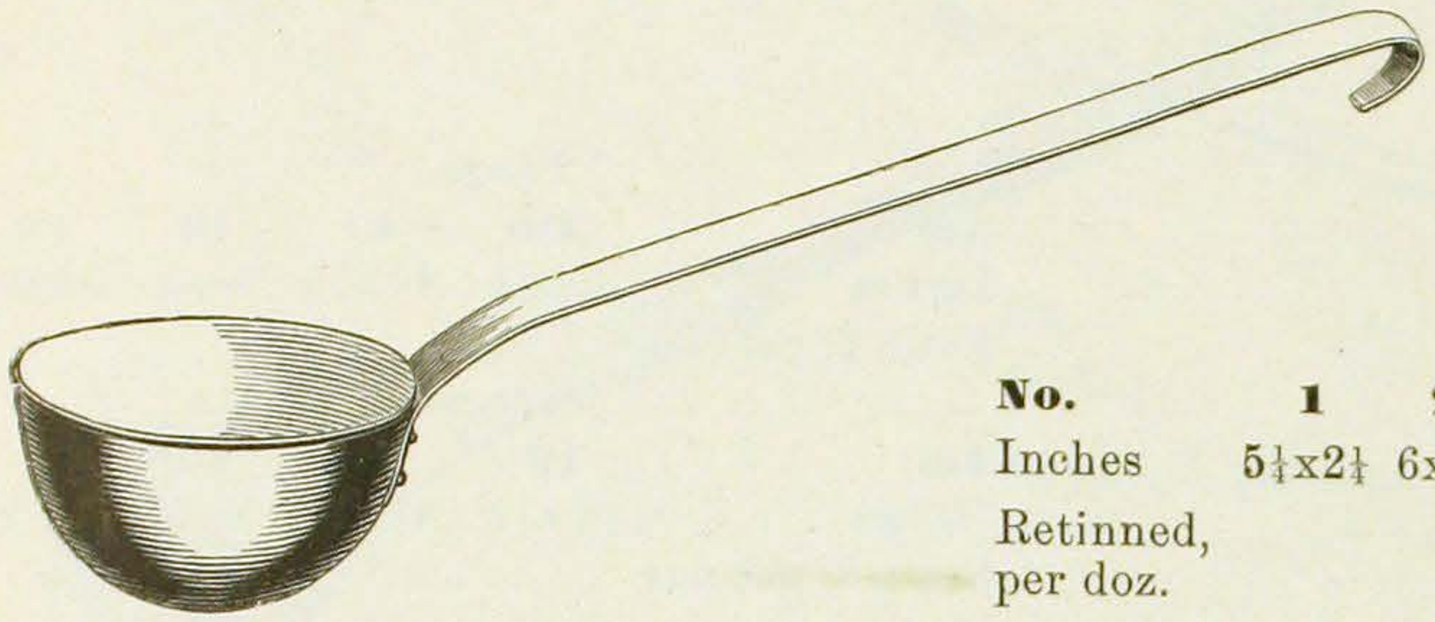
Retinned Deep Ladles—Wood Handled.



	Plain.					
No.	20	21	22	23	24	25
Inches	3½x1⅜	3⅝x1½	3⅞x1⅝	4⅜x1¾	4¾x2	5⅛x2
Retin'd per doz.						

	Pierced.					
No.	20	21	22	23	24	25
Inches	3½x1⅜	3⅝x1½	3⅞x1⅝	4⅜x1¾	4¾x2	5⅛x2
Retin'd, per doz.						

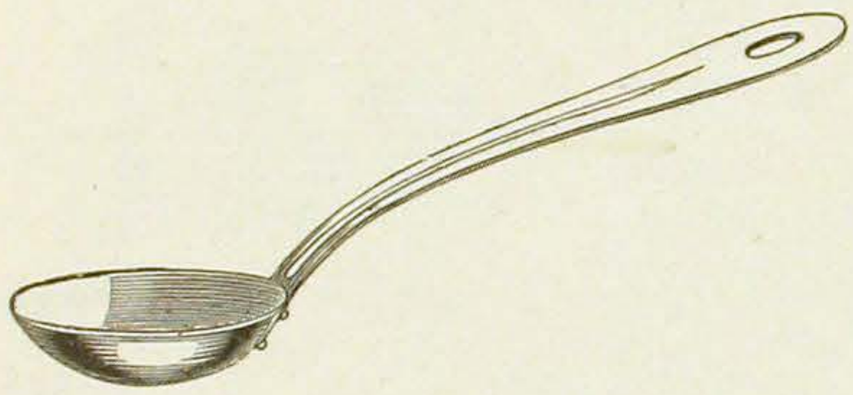
Retinned Extra Deep Navy Ladles—Half Oval Handled.



CURVED HANDLE.

No.	**1**	**2**	**3**	**4**
Inches	5¼x2¼	6x2¾	7¾x3¾	8x4
Retinned, per doz.				

Retinned Shallow Ladles—Threaded Handle.



PLAIN.

No.	**1**	**2**	**3**	**4**
Inches	3½x1	3⅞x1	4x1⅛	4½x1⅜
Retinned, per doz.				

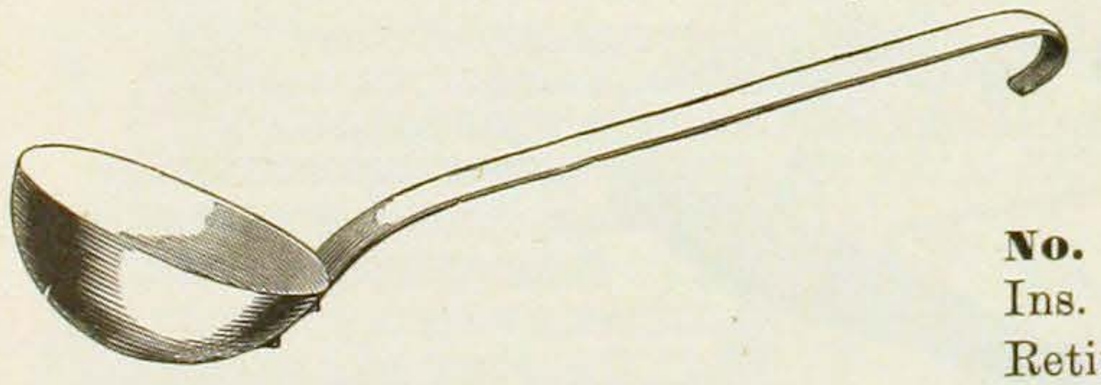
PIERCED.

No.	**1**	**2**	**3**	**4**
Inches	3½x1	3⅞x1	4x1⅛	4½x1⅜
Retinned, per doz.				

Retinned Soup Ladles—Forged Handled.

No.	**139**	**140**	**141**
Inches . .	3⅜x⅞	3¾x1	4⅛x1⅛
		PLAIN.	
Retinned, per doz.			
		PIERCED.	
Retinned, per doz.			

Retinned Deep Ladles—Flat Handled.



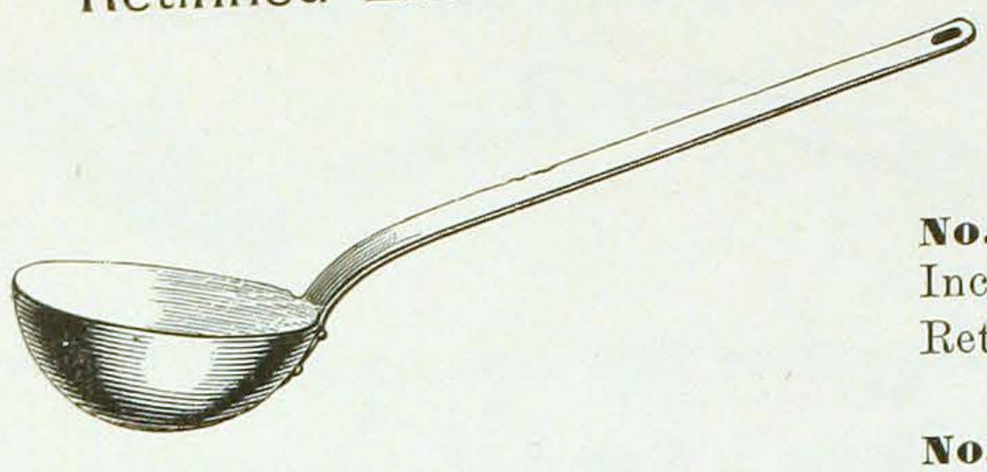
PLAIN.

No.	**8**	**9**	**10**	**11**	**12**	**13**
Ins.	3½x1⅜	3⅝x1½	3⅞x1⅝	4⅜x1¾	4¾x2	5⅛x2
Retin'd, per doz.						

PIERCED.

No.	**8**	**9**	**10**	**11**	**12**	**13**
Ins.	3½x1⅜	3⅝x1½	3⅞x1⅝	4⅜x1¾	4¾x2	5⅛x2
Retin'd, per doz.						

Retinned Extra Strong Deep Ladles—Half Oval Handled.



PLAIN.

No.	10	11	12	13
Inches .	$3\frac{7}{8}$x$1\frac{3}{4}$	$4\frac{3}{8}$x$1\frac{3}{4}$	$4\frac{1}{2}$x2	$5\frac{1}{8}$x2
Retin'd, per doz.				

PIERCED.

No.	10	11	12	13
Inches .	$3\frac{7}{8}$x$1\frac{3}{4}$	$4\frac{3}{8}$x$1\frac{3}{4}$	$4\frac{1}{2}$x2	$5\frac{1}{8}$x2
Retin'd, per doz.				

Retinned Soup Ladles.

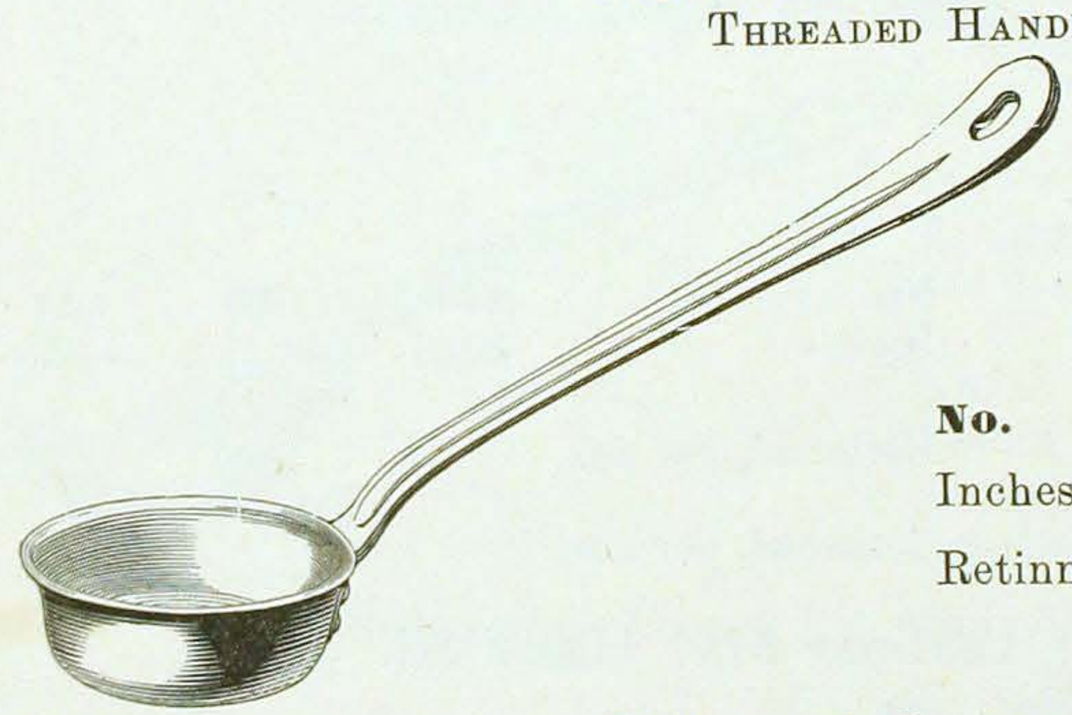
WOOD HANDLED.



No.	240
Inches	$3\frac{3}{4}$x1
Retinned, per doz.	

Retinned Soup Ladles.

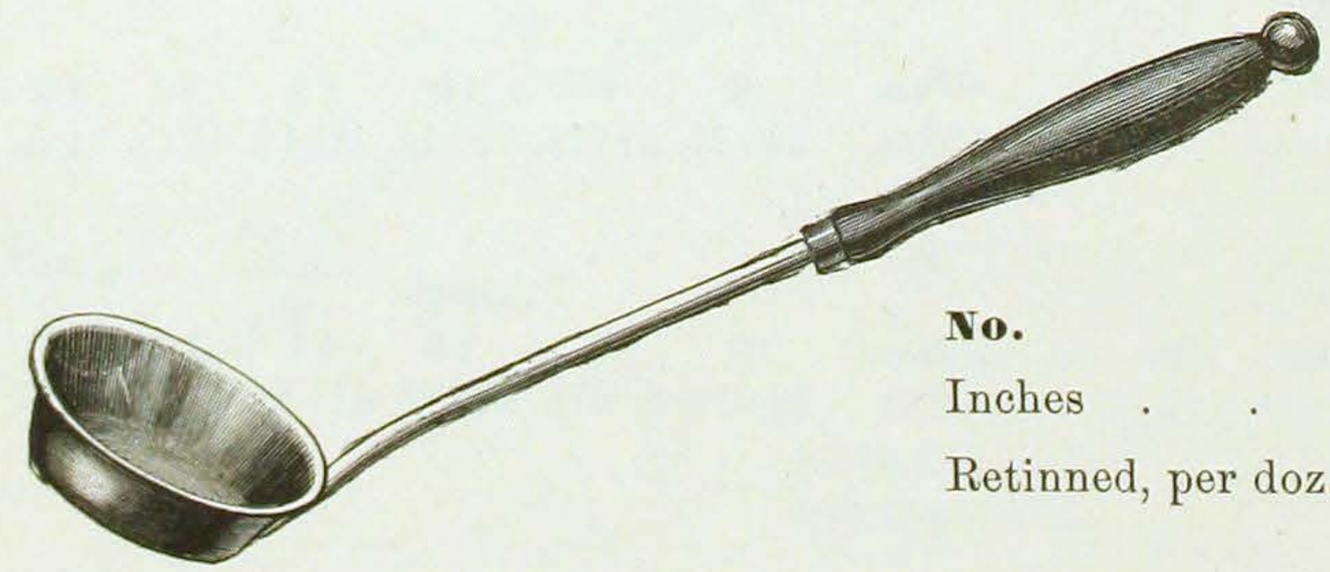
THREADED HANDLED.



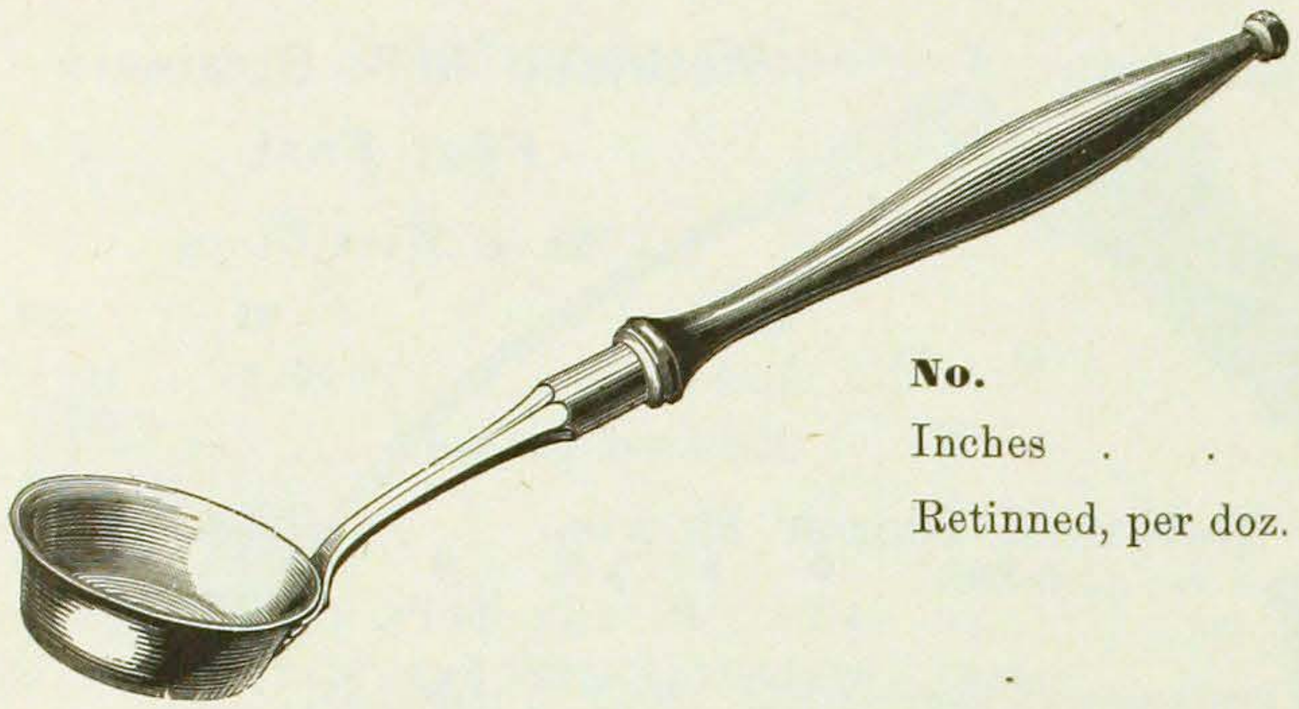
No.	38	39
Inches	$3\frac{3}{4}$x$1\frac{1}{4}$	4x$1\frac{1}{2}$
Retinned, per doz.		

Retinned Soup Ladles.

WOOD HANDLED.



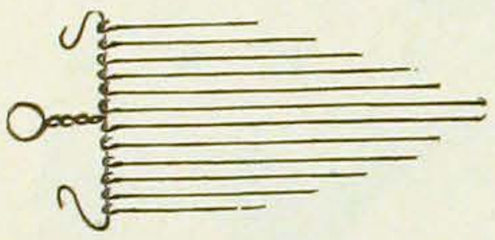
No.	229	230
Inches	$3\frac{3}{4}$x$1\frac{1}{4}$	4x$1\frac{1}{2}$
Retinned, per doz. . . .		



Retinned Soup Ladles.

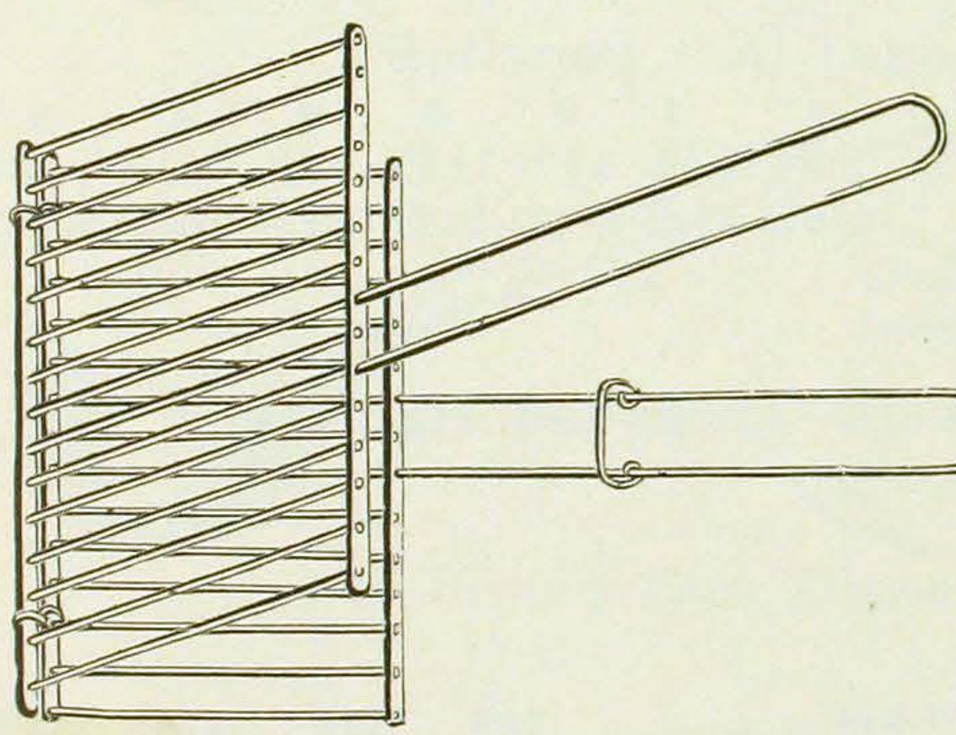
WOOD HANDLED.

No.	29	30
Inches	3¾x1¼	4x1½
Retinned, per doz.		



Retinned Skewers.

No.	1
Retinned, per doz. Sets	

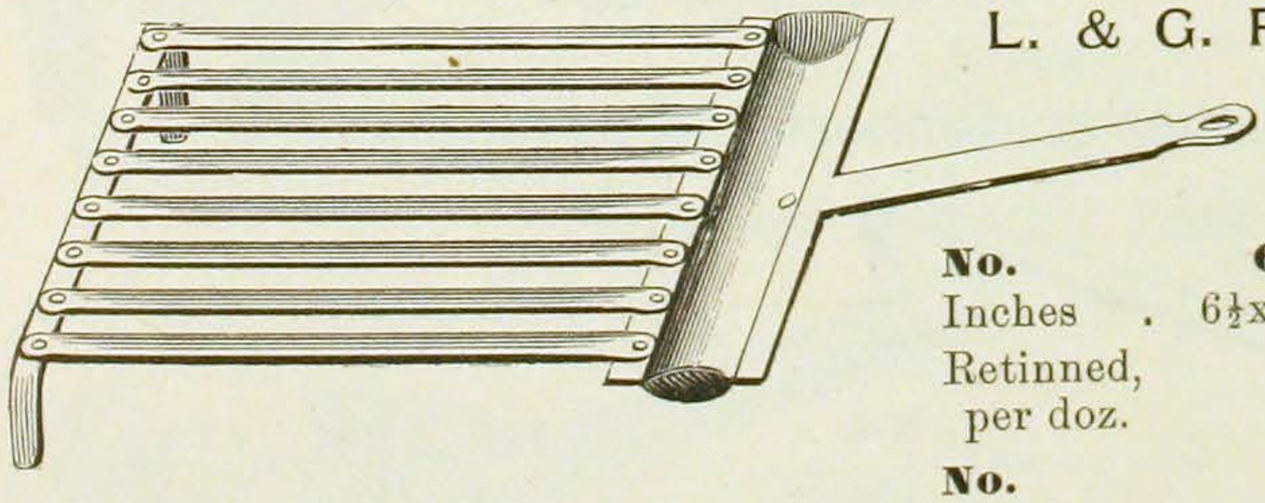


L. & G. Retinned Extra Heavy Wire Broilers.

PATENTED.

No.	20	21	22
Inches	9x7	11x8	12½x9
Retinned, per doz.			

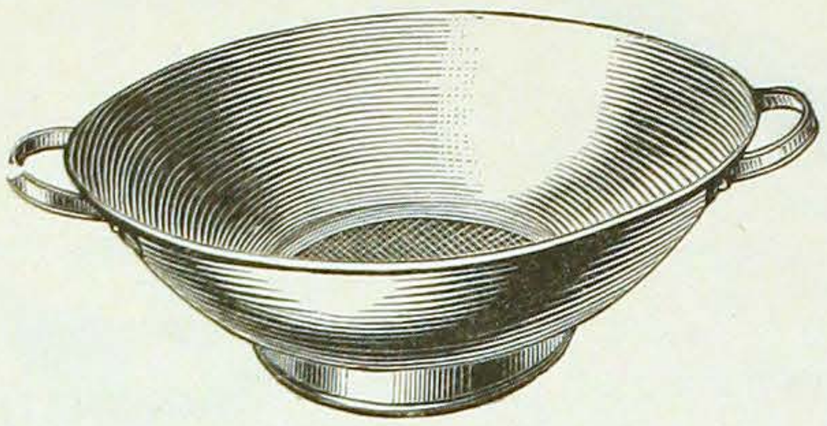
No.	23	24	25
Inches	13½x10	15x11	16½x12½
Retin'd, per doz.			



L. & G. Retinned Gridirons.

No.	6	7	8	9
Inches	6½x10½	7½x10½	8¼x12	10x12
Retinned, per doz.				

No.	10	11	12
Inches	11x13	12x13	13x13½
Retinned, per doz.			



Retinned Milk Strainers—Feet Fast.

Brass Wire Cloth.

No.	21	22
Inches . .	10x3¼	10¾x3¼
Retinned, per doz.		

Retinned Dipper Bowls.



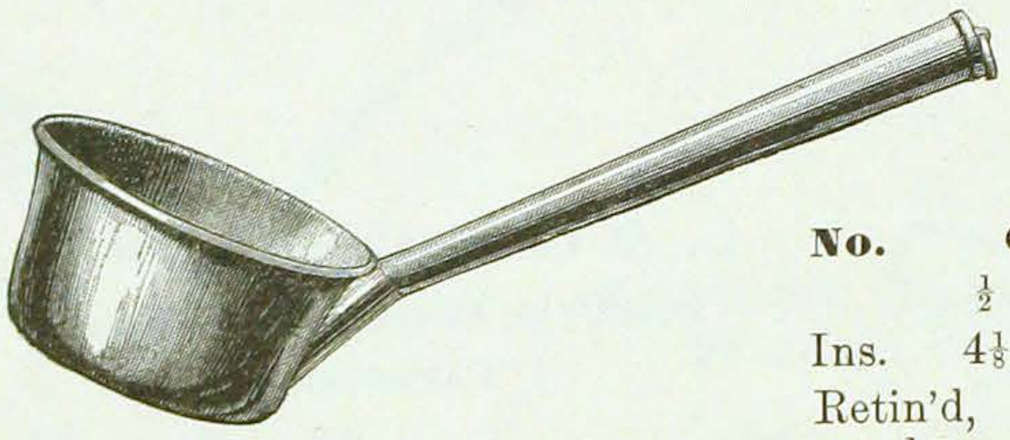
No.	0	1	2	3	4	5	6
	½ Pt.	¾ Pt.	1 Pt.	1½ Pt.	1 Qt.	2 Qts.	3 Qts.
Ins.	4⅛x1⅞	4¼x2	4¾x2⅛	5x2¼	5⅜x2½	5¾x2⅝	6½x3⅛
Retin'd, per doz.							

Handles.



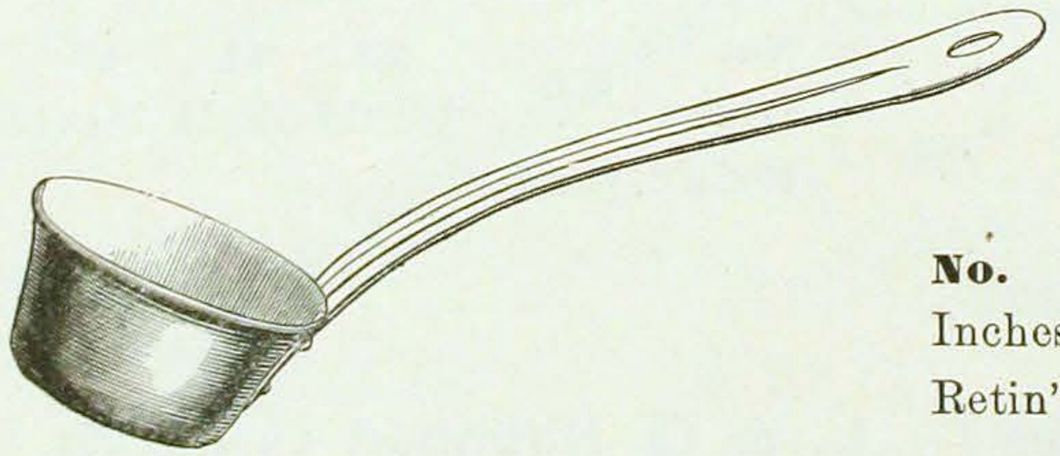
No.	0	1	2	3	4	5	6
Per doz.							

Retinned Water Dippers.



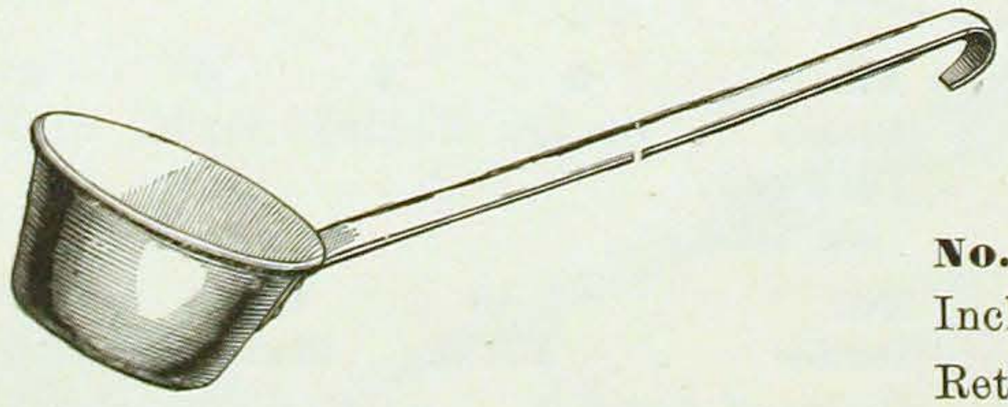
No.	0	1	2	3	4	5	6
	½ Pt.	¾ Pt.	1 Pt.	1½ Pt.	1 Qt.	2 Qts.	3 Qts.
Ins.	4⅛x1⅞	4¼x2	4¾x2⅛	5x2¼	5⅜x2½	5¾x2⅝	6½x3⅛
Retin'd, per doz.							

Retinned Flaring Dippers—Threaded Handles.



No.	116	117	118	119
Inches .	4¼x2	4½x2¼	5x2¼	5¼x2¼
Retin'd, per doz.				

Retinned Flaring Dippers—Flat Handled.



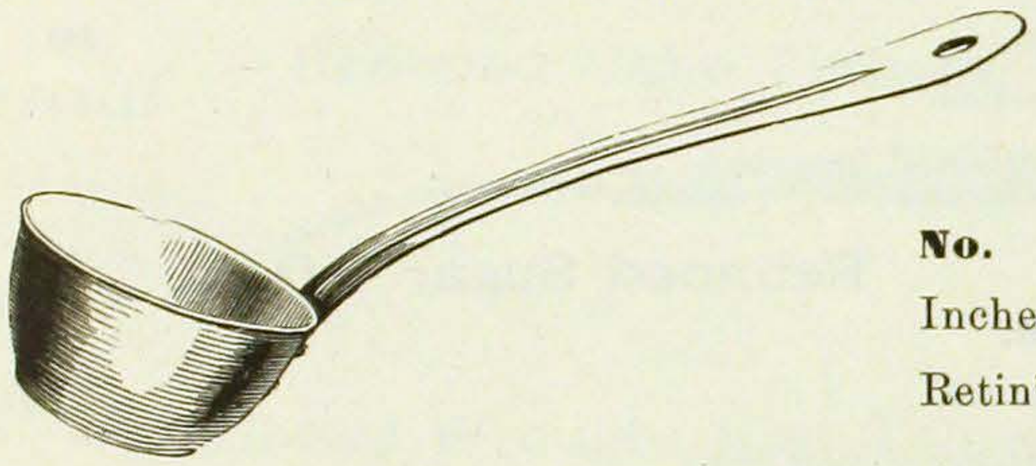
No.	110	111	112	113
Inches .	4¼x2	4½x2¼	5x2¼	5¼x2¼
Retin,d, per doz.				

Retinned Dippers—Forged Handled.



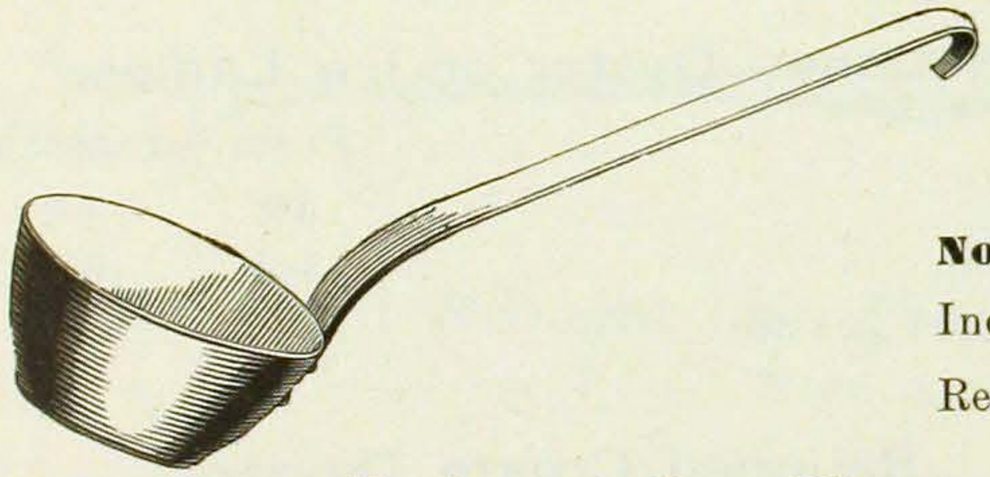
No.	**100**	**101**
Inches	4x1¾	4¼x2
Retinned, per doz. . .		

Retinned Cup Dippers—Threaded Handled.



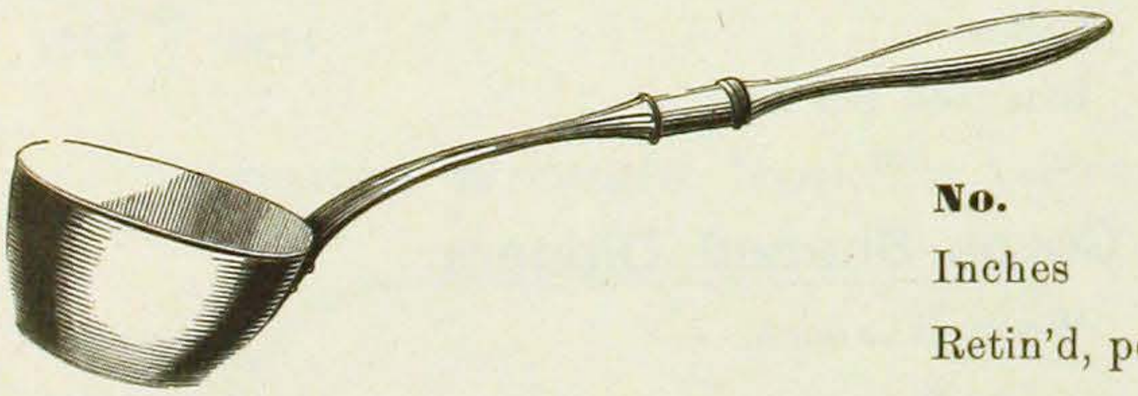
No.	**14**	**15**	**16**	**17**
Inches .	3¾x2	4¼x2½	4½x2¼	5x2¼
Retin'd, per doz.				

Retinned Cup Dippers—Flat Handled.



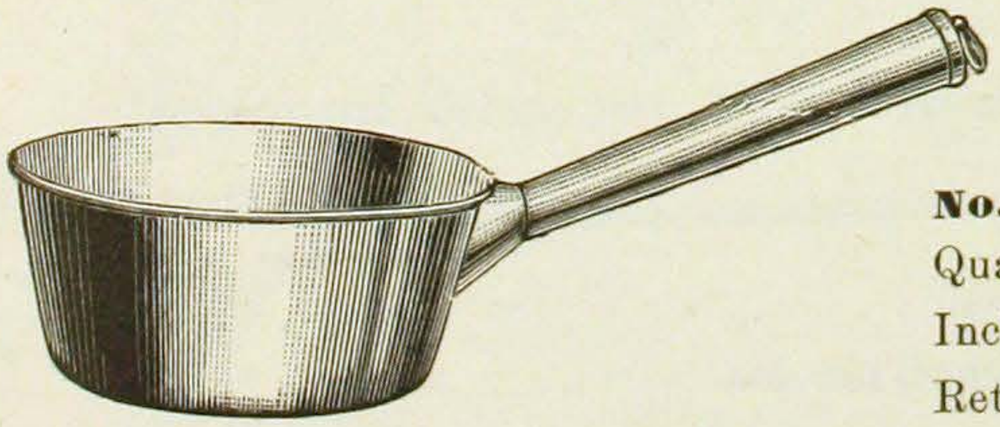
No.	**8**	**9**	**10**	**11¶**
Inches .	3¾x2	4¼x2¼	4½x2¼	5x2¼
Retin'd, per doz.				

Retinned Cup Dippers—Wood Handled.



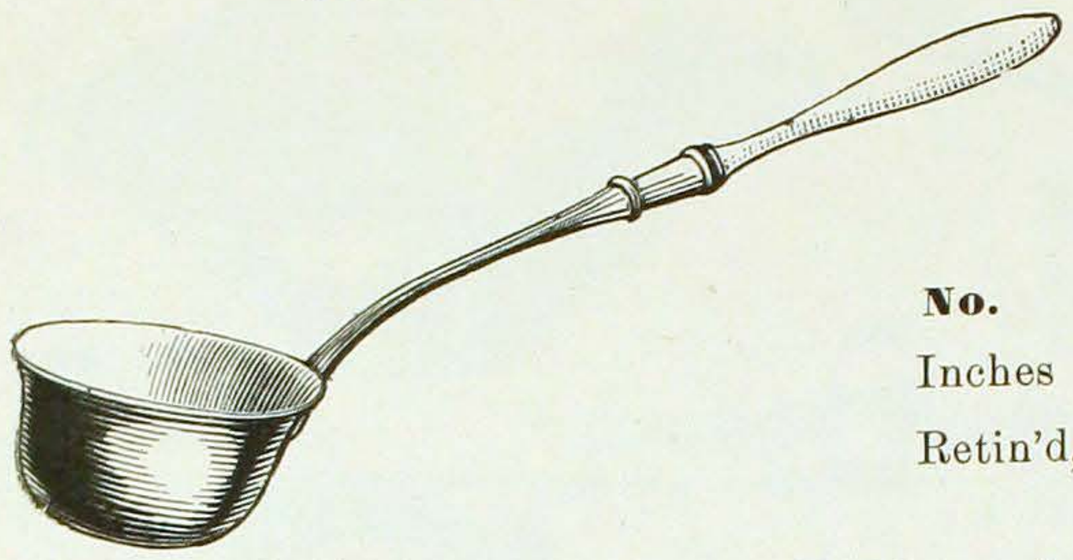
No.	**20**	**21**	**22**	**23**
Inches .	3¾x2	4¼x2¼	4½x2¼	5x2¼
Retin'd, per doz.				

Retinned Laundry Dipper.



No.	**20**
Quarts	4
Inches	8½x3¾
Retinned, per doz. . . .	

Retinned Flaring Dippers—Wood Handled.



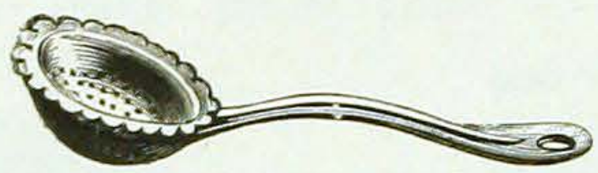
No.	122	123	124	125
Inches	4¼x2	4½x2¼	5x2¼	5¼x2¼
Retin'd, per doz.				

Retinned Scolloped Oyster Patties.



No.	10
Inches	5¼x4¼x1¼
Retinned, per doz.	

Retinned Sugar Sifters.



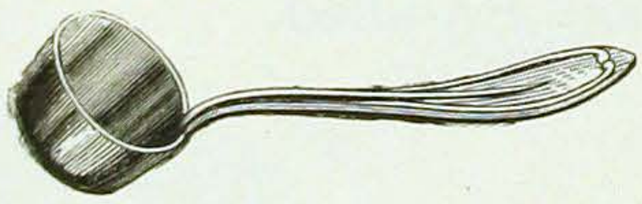
NO.	7
Inches	3⅜x¾
Retinned, per doz.	

Retinned Oyster or Ice Ladles.



	Plain.	Pierced.
No.	50	55
Inches.	3x1	3x1
Retinned, per doz.		

Retinned Cream Dippers.



No.	7	17
Inches	1¾x1	2x1¼
Retinned, per doz.		

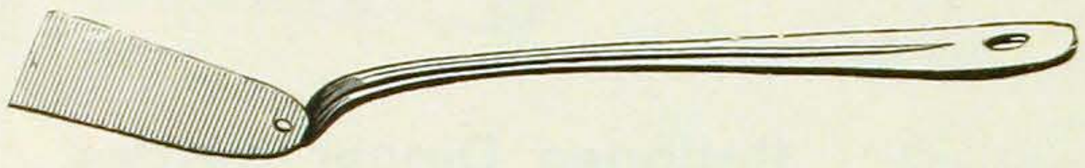
Retinned Cocoa-Shaped Dippers.

Wood Handled.



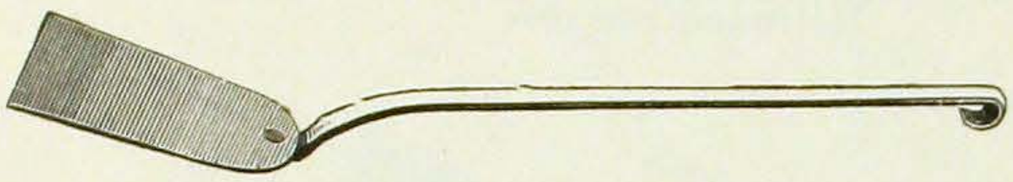
	Tin Socket.	Forged Rivetted Shank.
No.	51	151
Inches	4⅛x2½	4⅛x2½
Retinned, per doz.		

Retinned Cake Turners—Threaded Handles.



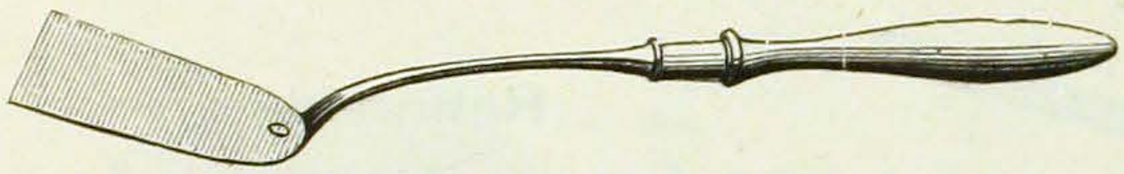
No.	15	16
Inches . .	3x3¾	3¼x4½
Retinned, per doz.		

Retinned Cake Turners—Flat Handled.



No.	13	14
Inches . . .	3x3¾	3¼x4½
Retinned, per doz.		

Retinned Cake Turners—Wood Handled.



No.	17	18
Inches . . .	3x3¾	3¼x4½
Retinned, per doz.		

Retinned Wrought Iron Two-Pronged Flesh Forks.

WOOD HANDLED.



PATENTED.

Inches	13	16
Retinned, per doz.		

Retinned Wrought Iron Three-Pronged Flesh Forks.

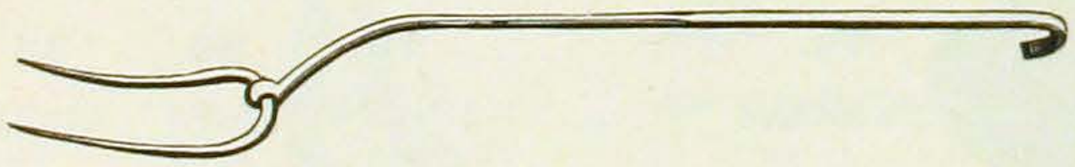
WOOD HANDLED.



PATENTED.

Inches	13	16
Retinned, per doz.		

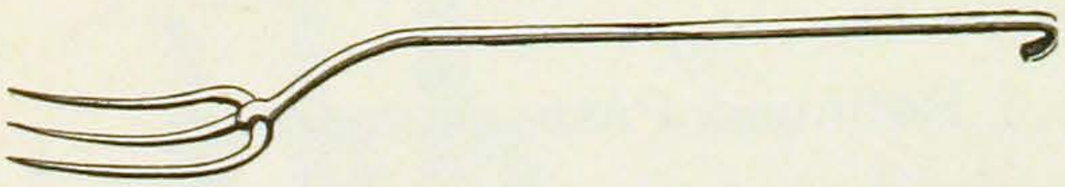
Retinned Wrought Iron Two-Pronged Flesh Forks.



PATENTED.

Ins.	13	15	18	20	22	24
Retin'd, per doz.						

Retinned Wrought Iron Three-Pronged Flesh Forks.



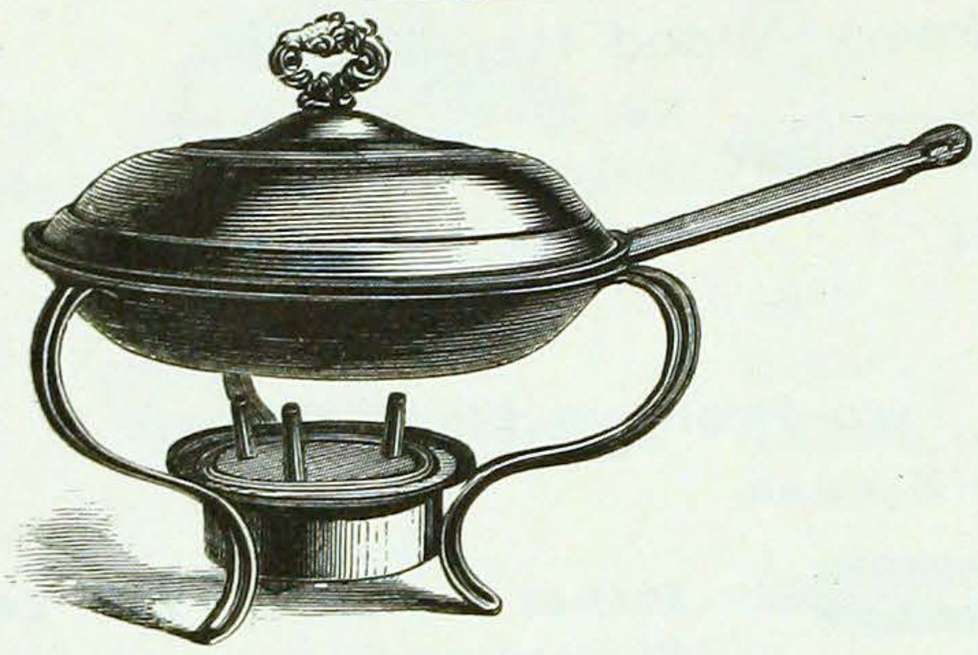
PATENTED.

Ins.	13	15	18	20	22	24
Retin'd, per doz.						



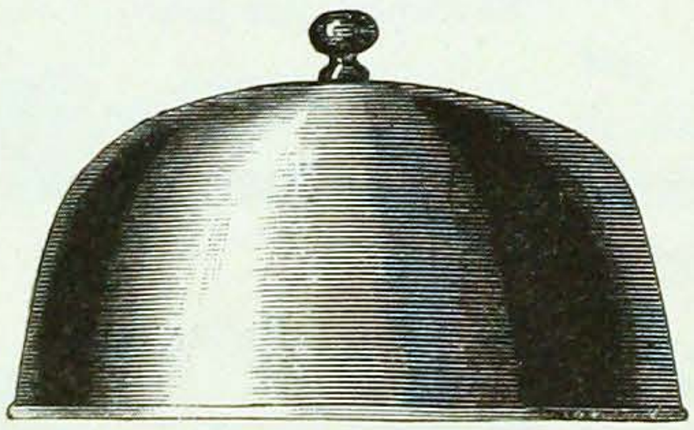
Retinned Dinner Kettles.

No.	**1**
Inches	6x10
Retinned, per doz.	



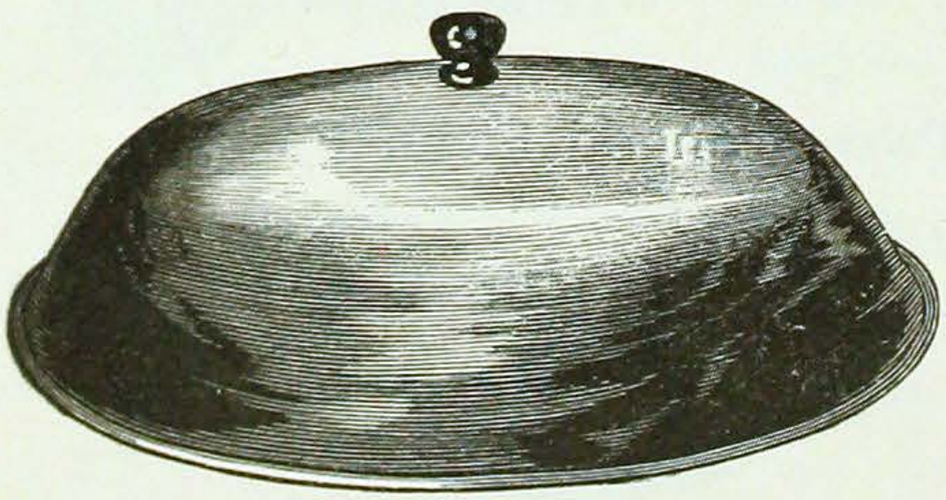
Retinned Iron Frame Oyster Chafers.

No.	**1½**
Retinned, per doz. . . .	



Retinned Round Chop or Steak Covers.

No.	**22**	**26**
Inches	8½	10¼
Retinned, per doz. . .		



Retinned Oval Chop or Steak Covers.

No.	**28**	**30**	**33**
Inches . .	10¾x7¾	12x8¾	13x9½
Retinned, per doz.			



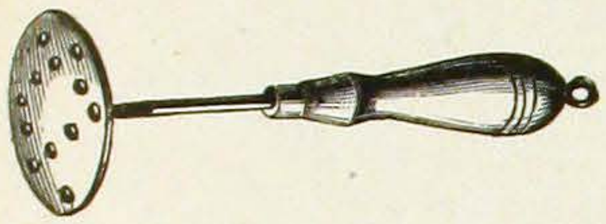
Retinned Paste Jaggers.

No.	**10**
Retinned, per doz.	



Retinned Paste Jaggers.

No.	**1**
Wood Handled, per doz.	



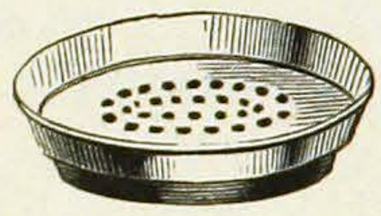
Retinned Potato Mashers.

No.	**1**
Retinned, per doz.	



Retinned Soap Dishes.

No.	**8**	**11**	**13**
Inches	$3\frac{1}{2}$x$\frac{3}{4}$	$4\frac{1}{4}$x$\frac{3}{4}$	$5\frac{1}{8}$x1
Retinned, per doz. . . .			



Retinned Soap Dishes.

No.	**01**	**1**
Inches	4x$1\frac{1}{4}$	$4\frac{3}{4}$x$1\frac{5}{8}$
Retinned, per doz.		



Retinned Soap Dishes.

No.	**0**
Inches	$4\frac{3}{8}$x$\frac{7}{8}$
Retinned, per doz.	



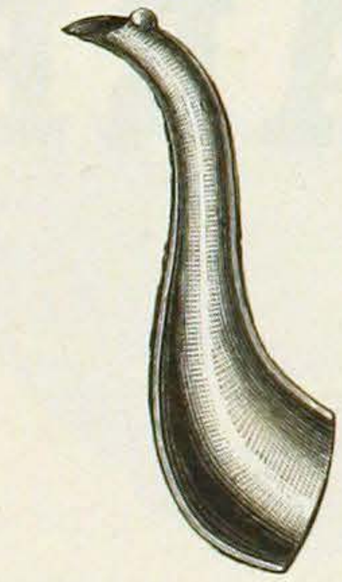
Retinned Oblong Soap Dishes.

No.	**40**
Inches	$5\frac{1}{2}$x$4\frac{1}{4}$x$1\frac{1}{2}$
Retinned, per doz.	



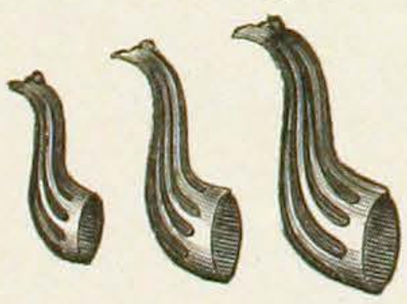
Retinned Covered Oblong Soap Dishes.

No.	**45**
Inches	$5\frac{1}{2}$x$4\frac{1}{4}$x$1\frac{1}{2}$
Retinned, per doz.	



Coffee Pot Spouts.

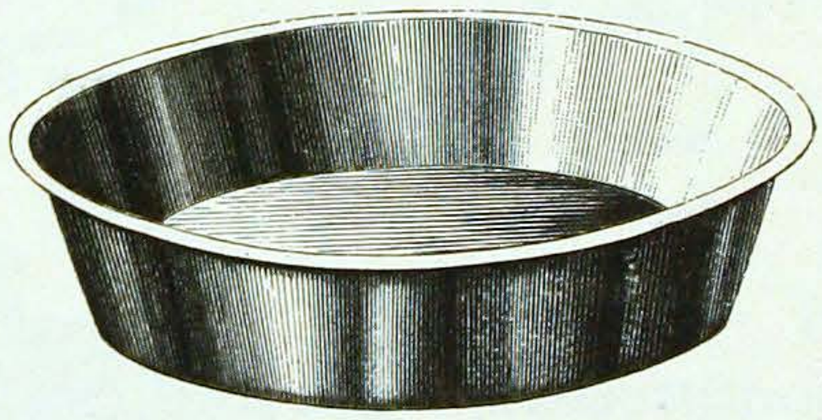
No.	**1**	**2**	**3**
Retinned, per gross			



Fluted Tea or Coffee Pot Spouts.

No.	**1**	**2**	**3**	**4**
Inches	$4\frac{7}{8}$	$5\frac{1}{8}$	6	$6\frac{1}{2}$
Retinned, per gross . . .				

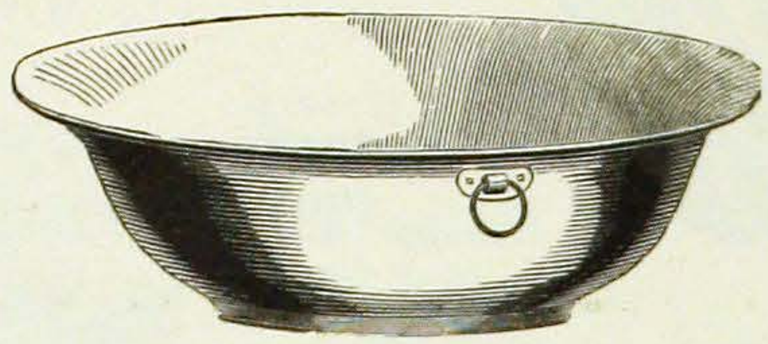
PLAIN



STAMPED WARE.

Plain Stamped Wash Basin.

WITHOUT RINGS.



LIGHT.

No.	**4½**	**5**	**5½**	**6**	**6½**	**7**	**7½**	**8**
Inches . .	7½x1¾	8x2	9x2¼	10x2½	10½x2¾	11½x2⅞	12¼x3	13x3
Plain St'p'd per doz.								

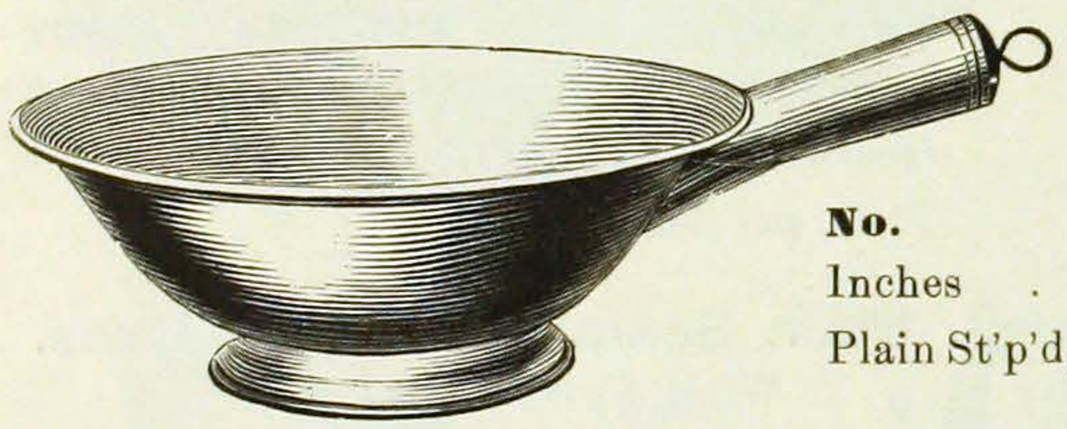
MEDIUM.

No.	**12**	**13**	**14**	**15**	**16**	**17**
Inches	10x2½	10½x2¾	11½x2⅞	12¼x3	13x3⅜	14x3½
Plain Stamped, per doz.						

Light or Medium, with rings, 10c. per doz. extra.

Plain Stamped Handled Wash Bowls.

WITH RINGS.



No.	**101**	**102**	**103**	**104**
Inches . .	9⅝x2¾	10⅝x3	11⅜x3⅜	12¾x3⅞
Plain St'p'd, per doz.				

Plain Stamped Light Wash Bowls.

WITHOUT RINGS.

We always send feet loose when not ordered fast.



No.	**010**	**020**	**031**	**035**	**040**
Inches .	9⅝x2¾	10½x3¼	11¼x3½	12x3½	12½x4
Feet loose, per doz.					
Feet fast, per doz.					

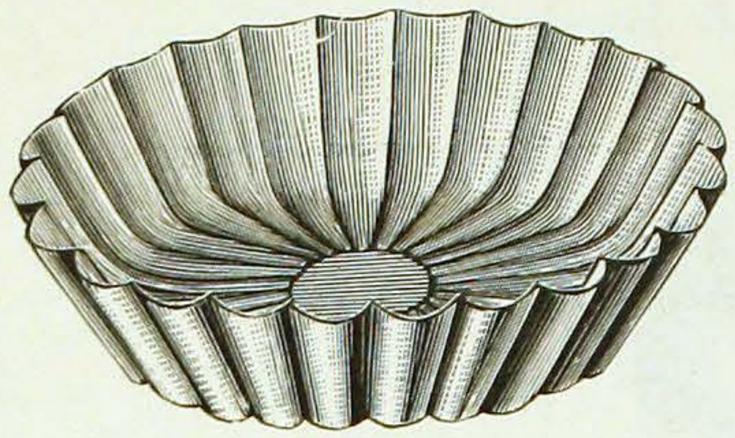
Plain Stamped Strong Wash Bowls.

WITHOUT RINGS.

We always send feet loose when not ordered fast.

No.	**100**	**200**	**300**	**400**
Inches . .	9⅝x2¾	10⅝x3	11⅜x3⅜	12¾x3⅞
Feet loose, per doz.				
Feet fast, per doz.				

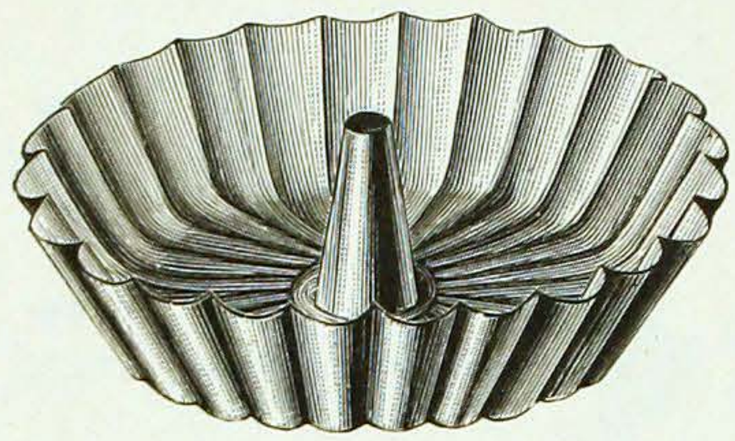
Light or Strong, with rings, 10c. per doz. extra.



Plain Scolloped Cake Pans.

WITHOUT TUBES.

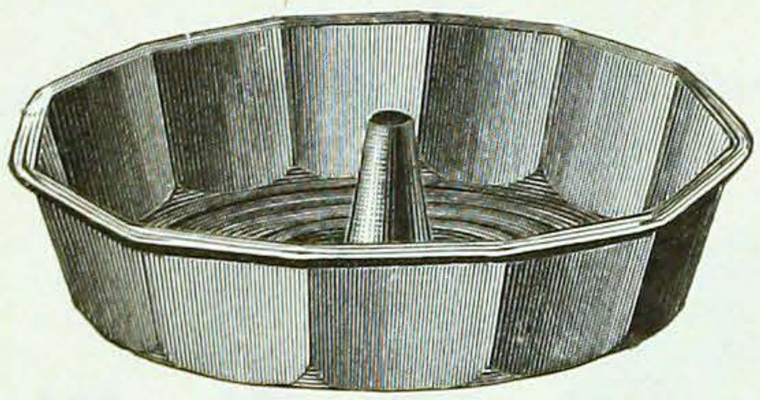
	SMALL.	MEDIUM.	LARGE.
Inches	**5½**	**8**	**10**
Plain, per doz. .			



Plain Scolloped Cake Pans.

WITH TUBES.

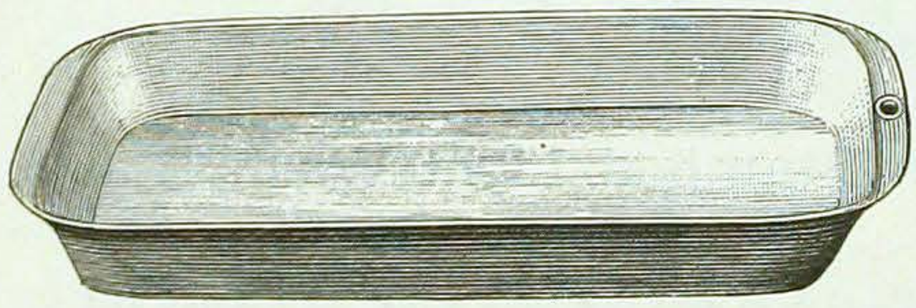
	SMALL.	MEDIUM.	LARGE.
Inches	**5½**	**8**	**10**
Plain, per doz. .			



Plain Cake Moulds, Dodecahedral.

WITH TUBES.

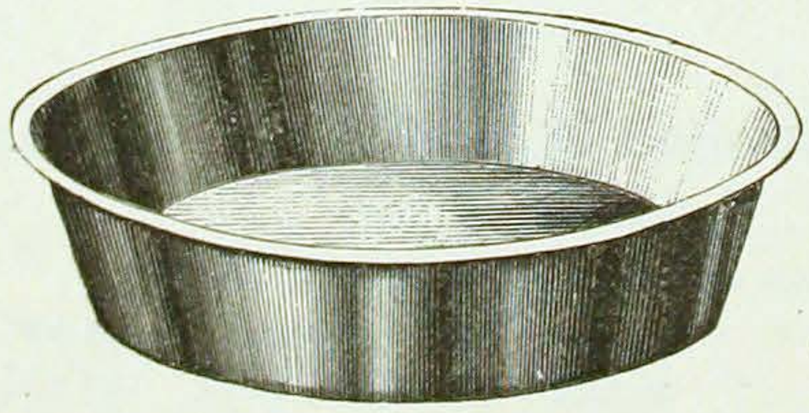
No.	**127**	**147**	**167**
Inches . . .	8½x2	9½x2⅜	10¾x2½
Quarts . . .	2	3	4
Plain, per doz. .			



Plain Seamless Oblong Pans.

WITH PATENT EYELET HOLE.

No.	**128**
Inches	12⅛x8⅛x1⅛
Plain, per doz.	



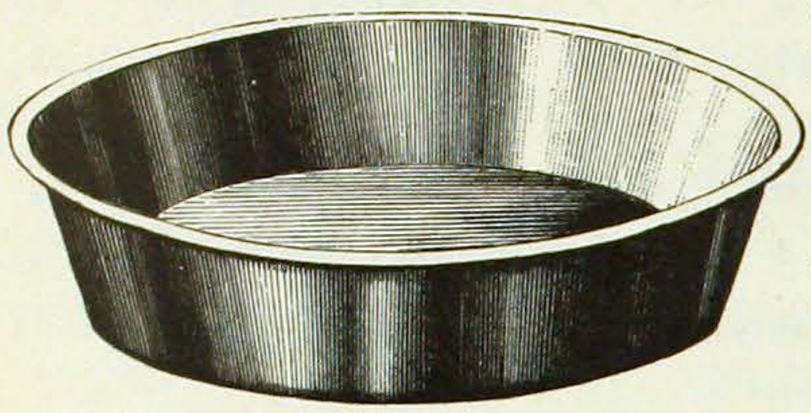
Plain Stamped Flat Edge Dairy Pans.

STRAIGHT OR FLARING.

Quarts	¼	½	**1**	**1½**	**2**	**3**	**3½**
Ins.	5¼x1⅜	6x1⅜	7x1⅝	7½x1¾	8½x2	9¼x2¼	10x2¼
Plain St'p'd, per doz.							

Quarts	**4**	**5**	**6**	**8**	**10**	**12**
Ins.	10⅝x2½	11⅝x2⅝	12⅝x2¾	13¼x2⅞	14¼x3	15x3⅛
Plain St'p'd, per doz.						

Straight always sent unless otherwise ordered.



Plain Stamped Flat Edge Milk Pans.

STRAIGHT OR FLARING.

			STRONG.		
Quarts	**3**	**3½**	**4**	**5**
Inches . .	9¼x2¼	10x2¼	10⅝x2½	11⅝x2⅝
Plain Stamped, per doz.				

Quarts	**6**	**8**	**10**	**12**
Inches . .	12⅝x2¾	13¼x2⅞	14¼x3	15x3⅛
Plain Stamped, per doz.				

EXTRA STRONG.

Plain Stamped, per doz.

Straight always sent unless otherwise ordered.



Plain Stamped Flat Edge Flaring Milk Pans.

EXTRA STRONG.

No.	**30**	**40**	**50**
Inches .	13⅜x2½	16x2⅞	18¾x3
Plain St'p'd per doz.			



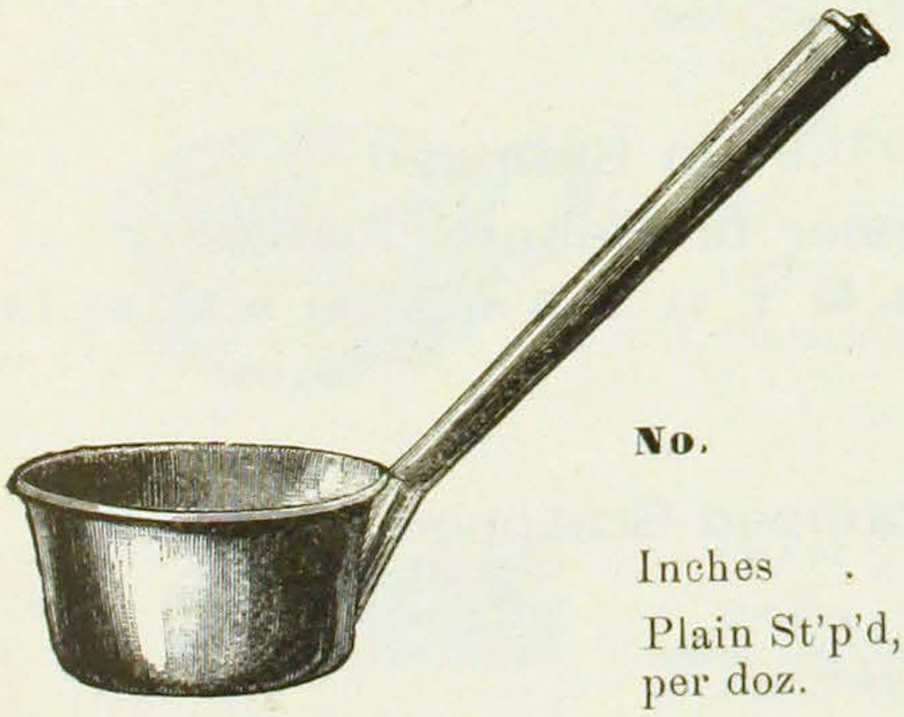
Plain Stamped Dipper Bowls.

No.	**0**	**1**	**2**	**3**	**4**	**5**	**6**
	½ Pt.	¾ Pt.	1 Pt.	1½ Pt.	1 Qt.	2 Qts.	3 Qts.
Inches .	4⅛x1⅞	4¼x2	4¾x2⅛	5x2¼	5⅜x2½	5¾x2⅝	6½x3⅛
Plain St'p'd, per doz.							



Handles.

Per doz.



Plain Stamped Water Dippers.

No.	**0**	**1**	**2**	**3**	**4**	**5**	**6**
	½ Pt.	¾ Pt.	1 Pt.	1½ Pt.	1 Qt.	2 Qts.	3 Qts.
Inches .	4⅛x1⅞	4¼x2	4¾x2⅛	5x2¼	5⅜x2½	5¾x2⅝	6½x3⅛
Plain St'p'd, per doz.							



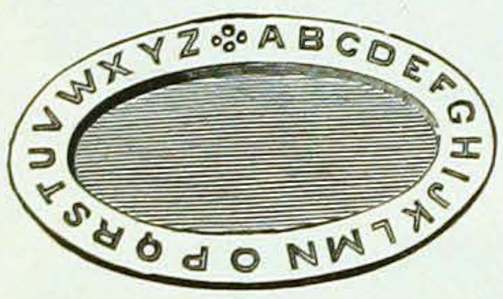
Plain Stamped Extra Deep Flat Edge Pudding Pans.

No.	015	016	017	018	019
Quarts .	½	1	1½	2	3
Inches .	6x2½	6¾x2¾	7½x3	8⅜x3⅛	9¼x3¼
I. C., per doz.					

No.	020	021	022	023	024
Quarts .	4	5	6	8	10
Inches .	10x3⅝	10¾x3¾	11⅜x4	12¾x4½	14¼x4¾
I. C., per doz.					

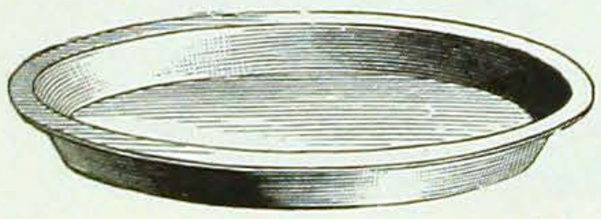
No.	15	16	17	18	19
Quarts .	½	1	1½	2	3
Inches .	6x2½	6¾x2¾	7½x3	8⅜x3⅛	9¼x3¼
I. X., per doz.					

No.	20	21	22	23	24
Quarts .	4	5	6	8	10
Inches .	10x3⅝	10¾x3¾	11⅜x4	12¾x4½	14¼x4¾
I. X., per doz.					



Plain Stamped Lettered Pie Plates.

Inches	5½	6
Plain Stamped, per gross		



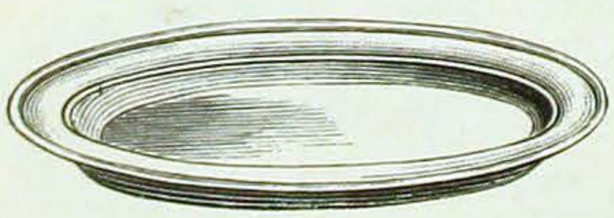
Plain Stamped Shallow Pie Plates.

Inches	6	7	8	9	10	11
Plain Stamped, per gross .						



Plain Stamped Deep Pie Plates.

Inches	9	10	11
Plain Stamped, per gross . . .			



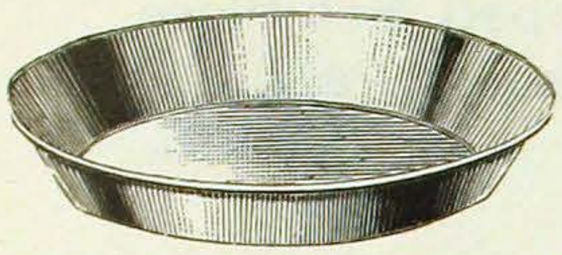
Plain Stamped Dinner or Bakers' Plates.

Inches	6	6⅝	7	7½	7¾	8	8¼	8½	8¾	9	9½	9¾	10
Plain St'p'd, per gross.													



Plain Stamped Scolloped Pie Plates.

Inches	6	7	8	9	10
Plain Stamped, per gross .					



Plain Stamped Lebanon Pie Plates.

Inches	**6**	**7**	**8**	**9**
Plain Stamped, per gross				



Plain Stamped Jelly Cake Pans.

Inches	**8**	**9**	**10**	**11**
Plain Stamped, per gross				

DEEP.

Inches	**6**	**7**	**8**	**9**	**10**	**11**
Plain Stamped, per gross						



Extra Deep Pans (Mountain Cake).

Inches	**8**	**9**	**10**
Plain Stamped, per gross . . .			



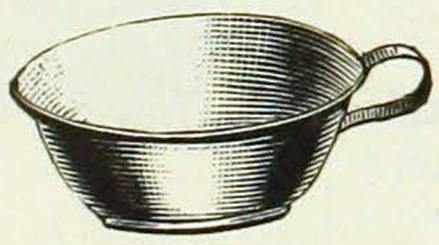
Gem Plates.

Inches	**6**	**7**	**8**	**9**	**10**
Per gross					



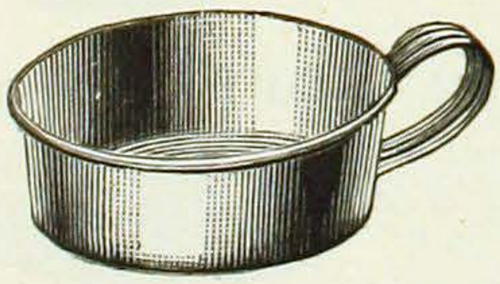
Plain Stamped California Cups.

No.	**2**	**4**
Pints	1	2
Inches	$4\frac{3}{4}$x$2\frac{1}{8}$	$5\frac{3}{8}$x$2\frac{1}{2}$
Plain Stamped, per doz. . . .		



Plain Stamped Cups.

No.	**0½**	**1½**	**2½**
Pints	½	1	2
Inches	$4\frac{1}{8}$x$1\frac{7}{8}$	$4\frac{3}{4}$x$2\frac{1}{8}$	$5\frac{3}{8}$x$2\frac{1}{2}$
Plain Stamped, per doz. .			



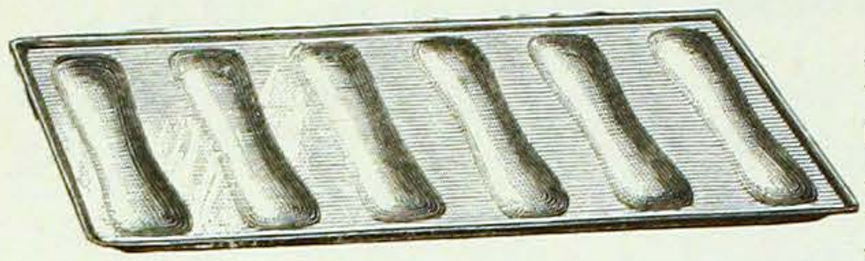
Plain Stamped Teamsters' Cups.

No.	**23**
Inches	$4\frac{3}{4}$x$2\frac{1}{4}$
Plain Stamped, per doz.	



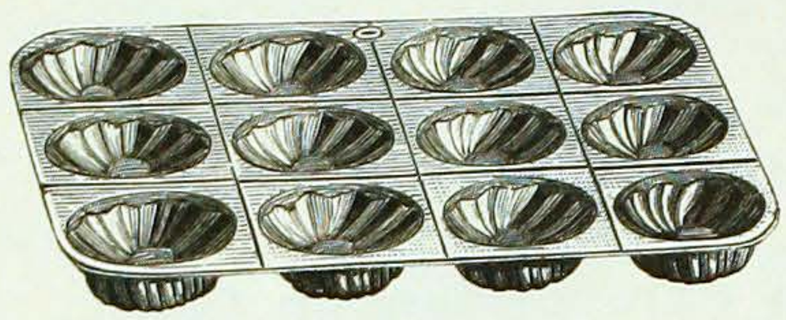
Pans Square Stamped.

Sheet	**½**	**1**
Inches	$6\frac{1}{4}$x$9\frac{1}{4}$x$\frac{3}{4}$	$8\frac{3}{4}$x13x$1\frac{1}{8}$
Per gross		



Plain Stamped Seamless Lady-Finger Pans.

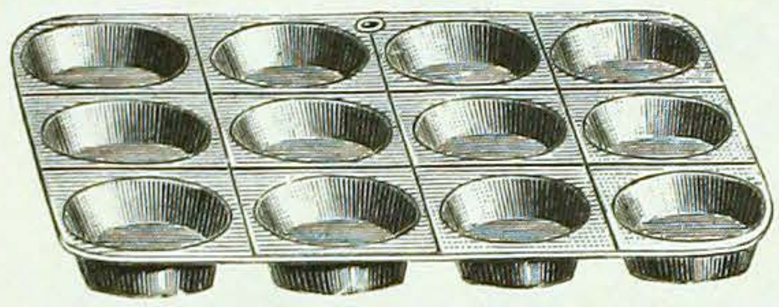
No.	10
Cups on Frame	6
Inches	12x6
Plain Stamped, per doz. frames	



Plain Turks' Head Muffin Pans.

PATENTED.

No.	1506	1508	1512
Cups on frame	6	8	12
Plain Stamped, per doz. frames.			



Plain Muffin Pans.

PATENTED.

MEDIUM SIZE CUPS.

No.	406	408	412
Cups on frame	6	8	12
Plain Stamped, per doz. frames			

LARGE SIZE CUPS.

No.	506	508	512
Cups on frame	6	8	12
Plain Stamped, per doz. frames			



Plain Stamped Muffin Cups.

No.	04	05	08
Inches	3x1	$3\frac{1}{2}$x$4\frac{1}{8}$	4x$1\frac{5}{8}$
Plain Stamped, per gross			



Plain Stamped Muffin Cups.

EXTRA DEEP.

No.	07
Inches	3x$1\frac{5}{8}$
Plain Stamped, per gross.	



Plain Stamped "Climax" Muffin Cups.

No.	011
Inches	$3\frac{3}{8}$
Plain Stamped, per gross	



Plain Stamped "Pearl" Muffin Cups.

No.	012
Inches	$3\frac{3}{4}$x2
Plain Stamped, per gross	



Plain Stamped Round Patty Pans.

Inches	**3**	**3½**	**4**	**4½**	**5**
Plain Stamped, per gross					



Plain Stamped Round Extra Deep Patty Pans.

Inches	**3½**	**4**	**5**
Plain Stamped, per gross			



Plain Stamped "Heart" Patty Pans.

Inches	**3**
Plain Stamped, per gross	



Plain Stamped "Star" Patty Pans.

Inches	**3⅜**
Plain Stamped, per gross	



Plain Stamped "Shell" Patty Pans.

Inches	**3**
Plain Stamped, per gross	



Plain Stamped Round Scolloped Patty Pans.

WITH FLAT EDGE.

Inches	**3**	**3½**	**4**	**4½**
Plain Stamped, per gross				



Plain Stamped Round Deep Scolloped Patty Pans.

Inches	**2½**	**3**	**3½**	**4**	**4½**
Plain Stamped, per gross					



Plain Stamped Oblong Patty Pans.

Inches	**3¾**
Plain Stamped, per gross	



Plain Stamped Oval Scolloped Patty Pans.

No.	**2**	**3**	**4**	**5**	**6**
Inches	3⅜	3⅞	4⅜	4⅞	5¼
Plain Stamped, per gross					



Milk Skimmers—Plain or Pierced.

Inches	**5¾x6**
Per gross	



Corrugated Funnels.

Nos.	**1**	**2**	**3**	**4**	**5**
Quarts	¼	½	1	2	4
Per doz.					



Pot Covers.

Inches	**7¾**	**8**	**8¼**	**8½**	**8¾**	**9**	**9¼**	**9½**
Per gross								
Inches	**9¾**	**10**	**10¼**	**10½**	**10¾**	**11**	**11¼**	**11½**
Per gross								
Inches	**11¾**	**12**	**12¼**	**12½**	**12¾**	**13¼**		
Per gross								



Pot Covers, Ringed, Edges Hemmed.

Inches	**9**	**9¼**	**9½**	**9¾**	**10**	**10¼**	**10½**	**10¾**
Per gross								
Inches	**11**	**11¼**	**11½**	**11¾**	**12**	**12¼**	**12½**	**12¾**
Per gross								



Steamer Bottoms.

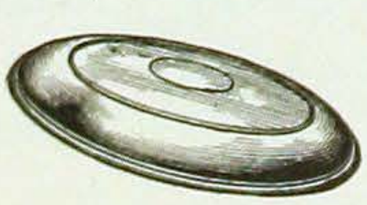
Inches	**7¾**	**8**	**8¼**	**8½**	**8¾**	**9**	**9¼**	**9½**
Per gross								
Inches	**9¾**	**10**	**10¼**	**10½**	**10¾**	**11**	**11¼**	**11½**
Per gross								
Inches	**11¾**	**12**	**12¼**	**12½**	**12¾**	**13¼**		
Per gross								



Bucket Covers.

Quarts	**½**	**1**	**1½**	**2**	**3**	**3½**	**4**
Inches	4⅝	5⅜	5⅞	6⅜	6⅞	7	7¾
Per gross							

Quarts	**5**	**6**	**7**	**8**	**10**	**12**	**14**	**16**	**20**
Inches	8 5/16	8⅝	8 15/16	9¼	9½	10½	11½	12½	13½
Per gross									



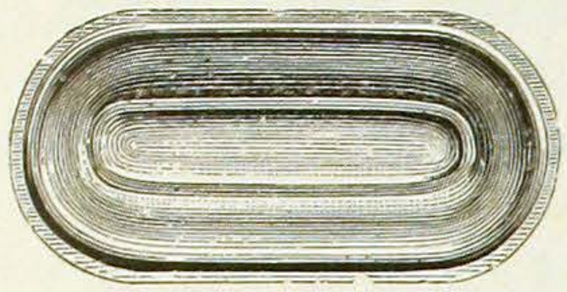
Oval Butter Kettle Covers.

No.	**00**	**0**	**1**	**2**	**3**	**4**
	1 Pt.	1 Qt.	2 Qts.	3 Qts.	4 Qts.	6 Qts.
Inches	5⅛x3 9/16	6¾x4⅝	7⅝x5 9/16	9⅜x6½	10¼x7⅜	11½x8½
Per gross						



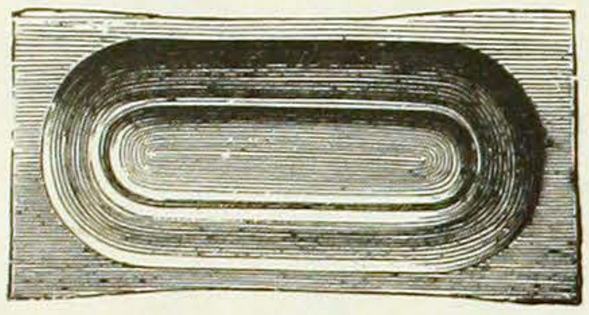
Cake Box Covers.

Inches	**11**	**11½**	**12**	**12½**	**13**	**13½**
Per gross						



Oval Rimmed Boiler Covers.

Sizes	**6**	**7**	**8**	**9**
Dimen., outside measure	17¾x9	10x19¾	11¾x21⅞	12⅞x23⅞
Per doz. . . .				



Flat Edge Boiler Covers.

Sizes	**6**	**7**	**8**	**9**
Dimen., outside measure	10x19⅛	10¾x20¼	11¾x21¾	12¾x23¾
Per doz. . . .				



Tea Kettle Breasts.

WITHOUT COVERS.

Inches	**6**	**6½**	**7**	**7½**	**8**	**8½**	**9**
Per gross							

Inches	**9½**	**10**	**10½**	**11**	**11½**	**12**	**13**
Per gross							



Tea Kettle Breasts.

WITH PLAIN COVERS.

Inches	**6**	**6½**	**7**	**7½**	**8**	**8½**	**9**
Per gross							

Inches	**9½**	**10**	**10½**	**11**	**11½**	**12**	**13**
Per gross							



Tea Kettle Breasts.

WITH RIMMED COVERS.

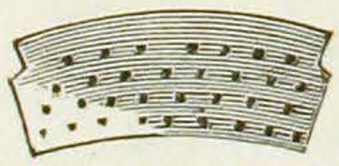
Inches	**6**	**6½**	**7**	**7½**	**8**	**8½**	**9**
Per gross							

Inches	**9½**	**10**	**10½**	**11**	**11½**	**12**	**13**
Per gross							



Round Tin Tea Kettle Bottoms.

Inches	**5½**	**6**	**6½**	**7**	**8**	**9**
Per gross						



Cullender Blanks.

Small.	**Large.**
3 GRO. BLANKS.	2 GRO. BLANKS

Per gross sets



Round Tea Pot Breasts and Covers.

PLAIN.

No.	32	33	34	35	36
Inches	4¼	4⅝	4⅞	5¼	5½
Pints	2	3	4	5	6
Per gross					



Round Tea Pot Breasts and Covers.

Plain, with rimmed covers, edges turned on breasts.

No.	142	143	144	145	146
Inches	4¼	4⅝	4⅞	5¼	5½
Pints	2	3	4	5	6
Per gross					

Round Tea Pot Breasts and Covers.

Retinned, with rimmed covers, edges turned on breasts.

No.	152	153	154	155	156
Inches	4¼	4⅝	4⅞	5¼	5½
Pints	2	3	4	5	6
Per gross					



Round Tea Pot Breasts and Covers.

SPUN.

No.	161	162	163	164	165	166
Inches	3 11/16	4	4⅜	4⅞	5	5¼
Pints	1	2	3	4	5	6
Per gross						



Round Tea Pot Breasts and Covers.

SPUN, HINGED, AND HOOPED.

No.	171	172	173	174	175	176
Inches	3 11/16	4	4⅜	4⅝	5	5¼
Pints	1	2	3	4	5	6
Per gross						



Plain Coffee Pot Covers.

Quarts	1	1½	2	3	3½	3¾	4	4½	5	5½	6	6½
Inches	3	3 3/16	3½	3¾	4	4⅛	4½	4¾	5	5⅛	5 9/16	5⅞
Per gross												



Rimmed Coffee Pot Covers.

Inches	2	2¼	2½	2¾	3	3½	4	4½	4¾	5	5½	6
Per gross												



Rimmed Bucket Covers.

Inches	**2¼**	**2½**	**2¾**	**3**	**3½**	**4**	**4½**	**4¾**	**5**	**5½**	**6**	**6½**	**7**
Per gross													



Bell-Shaped Covers.

SPUN.

Pints	**1**	**2**	**3**	**4**	**5**	**6**	**8**
Inches	2½	3	3½	3⅞	4¼	4 7/16	5⅛
Per gross							

Wash Bowl Bottoms.



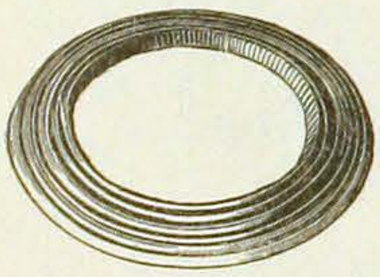
Inches	SMALL. **5¾**	LARGE. **6⅜**
Per gross		

Cullender Bottoms.



Inches	**6 5/16**
Per gross	

Stove Pipe Collars—Plain.



Inches	**4**	**4½**	**5**	**5½**	**5¾**	**6**	**7**
Per gross							

Stove Pipe Collars—Japanned.

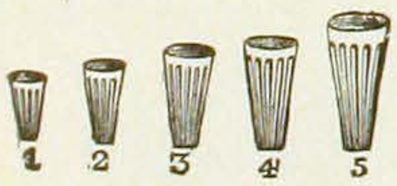
Inches	**4**	**4½**	**5**	**5½**	**5¾**	**6**	**7**
Per gross							



Grater Plates.

Sheets	**¼**	**½**	**1**
Inches	4¾x6⅞	6⅞x9¾	9¾x13
Per gross			

Funnel Tubes.



No.	**1**	**2**	**3**	**4**	**5**	**Assorted.** Nos.	1	2	3	4	5
Inches	1¾x1 1/16	2⅛x⅞	2½x1⅛	2¾x1¼	3⅜x1½	Doz.	2	4	3	2	1
Per gross											

Tin Knobs.



No.	SMALL. **1**	MEDIUM. **2**	LARGE. **3**	EXTRA LARGE. **4**
Per gross				



Coffee Boiler Lips.

To Rivet.

No.	**2**	**3**
Inches	2¾	3¼
Per gross		



Coffee Boiler Lips.

To Solder.

No.	**1**
Inches	3 1/16
Per gross	



Canopies—Without Rings.

Inches	⅝	¾	⅞	**1**	**1⅛**	**1¼**	**1⅜**	**1½**	**1⅝**	**1¾**	**1⅞**
Per gross											



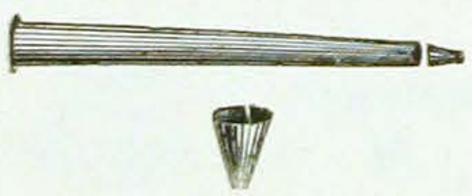
Canopies—With Rings.

Inches	⅝	¾	⅞	**1**	**1⅛**	**1¼**	**1⅜**	**1½**	**1⅝**	**1¾**	**1⅞**
Per gross											



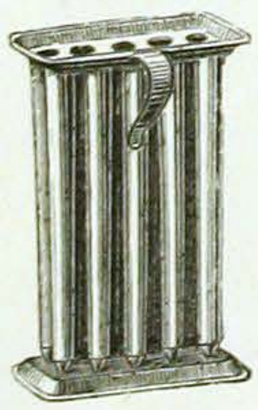
Candle Mould Pans.

Holes	**3**	**4**	**6**	**8**	**10**	**12**
Per gross						



Candle Mould Tubes and Tips.

Tubes, per gross	
Tips, per gross	



Candle Moulds.

Holes	**3**	**4**	**6**	**8**	**10**	**12**
Per dozen stands						
Per gross, holes						



Rattles.

A, B, C, per gross	
Old Style, per gross	



Muffin Rings.

Inches	**2½**	**3**	**3½**
Per gross			



Biscuit Cutters.

Inches	**2½**	**3**	**3½**
Per gross			



Doughnut Cutters.

Per gross . . . . . .



Tart Cutters.

Per gross . . . . . .



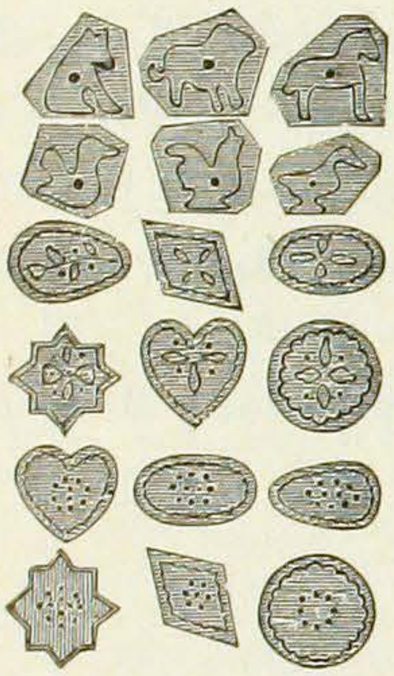
Can Nozzles.

Inches	¾	**1**	1¼	1½	1¾
Per gross					



Nozzles and Corks.

Inch	**1**
Per gross	



Cake Cutters.

	Oval Scolloped	Asst. Shapes. Plain Centre.	Asst. Shapes. Fancy Centre.	Asst. Shapes. Fancy Centre.	Oak Leaf.
No.	**0**	**1**	**2**	**3**	**4**
Per gross					

Cake Cutters.

ANIMAL.

No.	**10**	**20**	**30**
Sizes.	SMALL.	MEDIUM.	LARGE.
Per gross			



Blow Horns.

PLAIN.

	Screw.	Without Screw.	Extra with Screw.	Extra without Screw.
No.	**01**	**02**	**1**	**2**
Inches . .	11½	11½	13	13
Per gross				



Blow Horns.

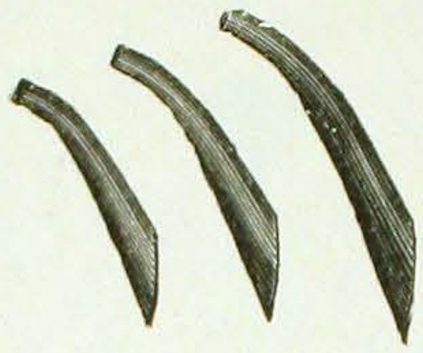
JAPANNED.

	Screw.	Without Screw.	Extra with Screw.	Extra without Screw.
No.	**03**	**04**	**3**	**4**
Inches . .	11½	11½	13	13
Per gross				



Heads for Blow Horns.

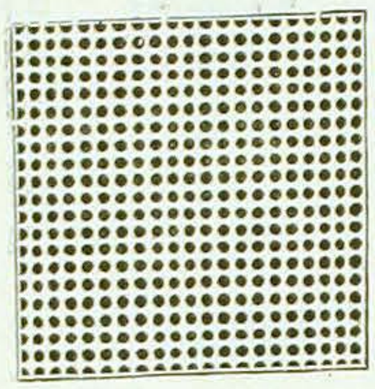
Per gross



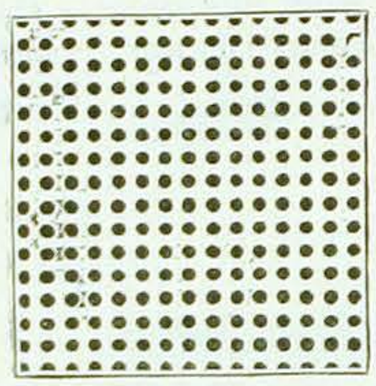
No. 1.

Oil Can Spouts.

No.	0	6	7	8
Inches	2¼	5½	4½	3½
Per gross				



No. 2.

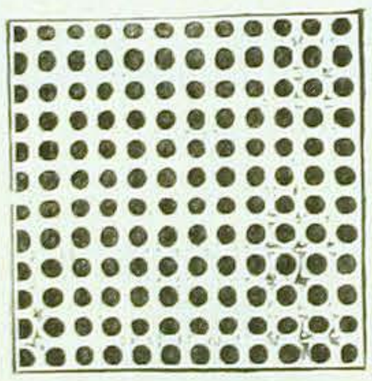


No. 3.

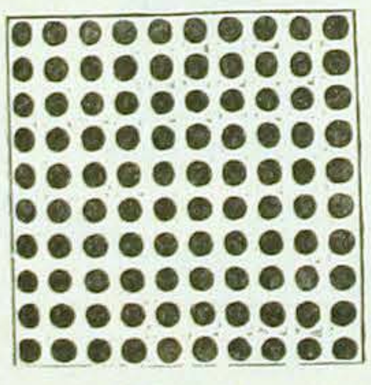
Perforated Tin.

These cuts of perforated tin represent the exact texture, size of holes, and spaces between them.

No.	1	2	3
Perforations to the inch	21	15	12
Description	Extra Fine.	Fine.	Medium.
Per dozen sheets			



No. 4.



No. 5.

Perforated Tin.

No.	4	5	6
Perforations to the inch	10	9	7
Description	Coarse.	Medium Coarse.	Extra Coarse.
Per dozen sheets			

Stock sizes 10x14 and 14x20.



Spouts, Engineer Can.

Inches	**6**
Per gross	

Wire Rings.



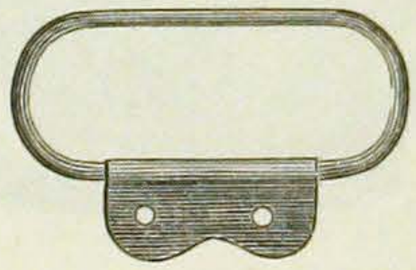


PRICE-LIST TINMEN'S WIRE RINGS.

No.	**1**	**2**	**3**	**4**	**5**	**6**
Size	½ in.	¾ in.	⅞ in.	1 in.	1¼ in.	1½ in.
Bright Wire without clips	$0.05	$0.06	$0.08	$0.09	$0.11	$0.14
Bright Wire with clips	0.11	0.13	0.16	0.17	0.19	0.22
Tinned Wire without clips	0.07	0.08	0.11	0.12	0.14	0.16
Tinned Wire with clips	0.13	0.15	0.18	0.20	0.21	0.24

The above prices are for the rings packed in one-gross boxes.

Dripping Pan Handles.



PRICE-LIST DRIPPING-PAN HANDLES.

No.	**7**	**8**	**9**	**10**	**11**
Size	1¼x2½	1½x2⅝	1⅝x3	1⅝x3½	1⅝x4
Bright Wire without clips	$0.25	$0.30	$0.35	$0.40	$0.45
Bright Wire with clips	0.50	0.60	0.65	0.70	0.75
Tinned Wire without clips	0.37	0.42	0.46	0.50	0.54
Tinned Wire with clips	0.60	0.70	0.75	0.85	0.90



JAPANNED WARE.



Japanned Hinged Canisters— Tea or Coffee.

Pounds	½	1	1½	2	3	4	6
Per doz. . .							



Japanned Common Canisters— Tea or Coffee.

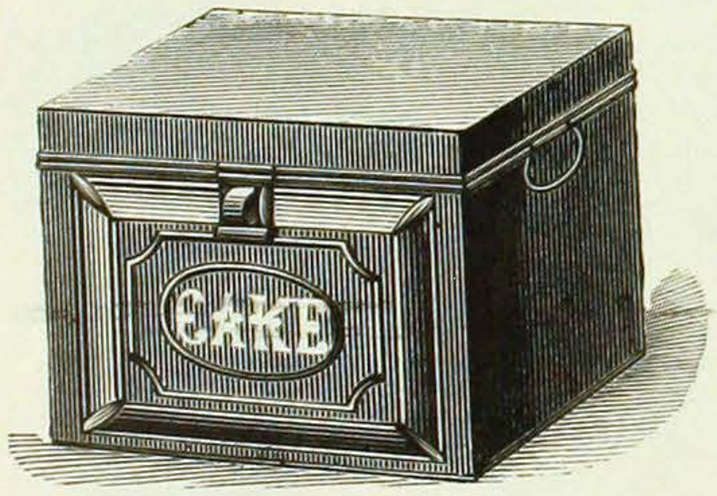
Pounds	¼	½	¾	1	2	3	4	6	10
Per doz.									



Round Cake Boxes.

NEST OF 3.

Small, 11x7½. . .	Per Nest of 3.
Medium, 12x9 . .	
Large, 13x10 . .	



Square Cake or Bread Boxes.

NEST OF 3.

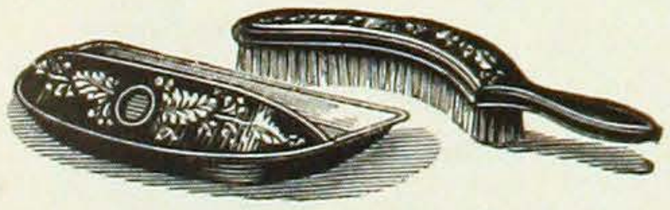
Small, 13x9¼x9¾ . .	Per Nest of 3.
Medium, 15x10¼x10¾ .	
Large, 15¾x11⅜x12⅝ .	



Chamber Pails.

ASSORTED COLORS.

	SMALL.	MEDIUM.	LARGE.
Quarts	**10**	**12**	**14**
Per doz. .			



Crumb Trays and Brushes.

ASSORTED COLORS

	SMALL.	LARGE.
Per doz.		



Deed boxes.

WITH HASPS.

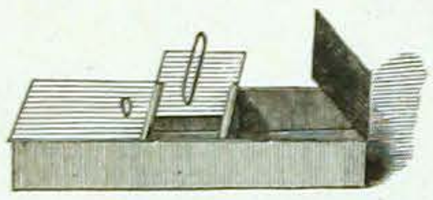
No.	0	1	2	3	4
Inches	8½	9½	10½	11½	13½
Dimen.	8½x5¾x3¼	9½x6¾x3⅝	10½x7⅝x4½	11½x8½x5¼	13½x9½x5½
Per doz.					



Cash Boxes.

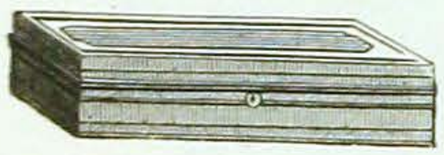
WITH LOCK AND KEY.

No.	0	1	2	3	4
Inches	8½	9½	10½	11½	13½
Dimen.	8½x5¾x3¼	9½x6¾x3⅝	10½x7⅝x4½	11½x8½x5¼	13½x9½x5½
Per doz.					



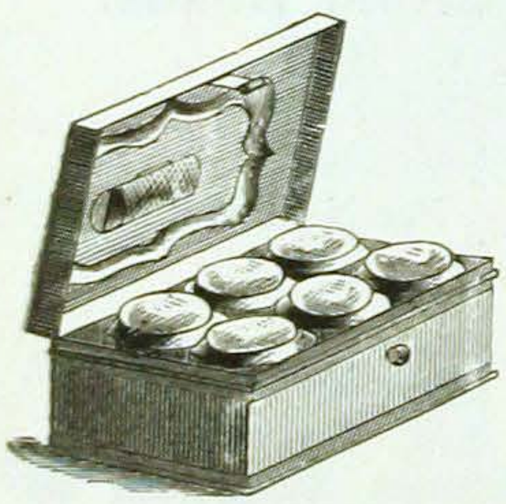
Trays for Cash Boxes.

Inches	8½	9½	10½	11½	13½
Per doz.					



Bond Boxes.

No.	01	02
Dimensions	10x5¼x2¾	10x5¼x4
Per doz.		



Spice Boxes.

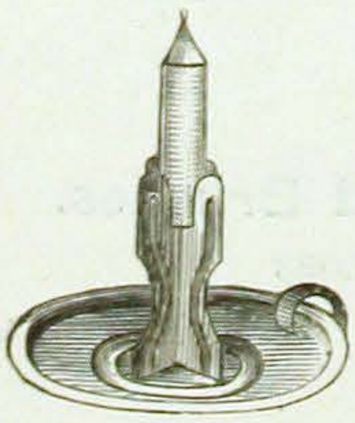
Square Boxes Inside	9½ in.
Per doz.	

Round Boxes Inside	9½ in.
Per doz.	



Candlesticks.

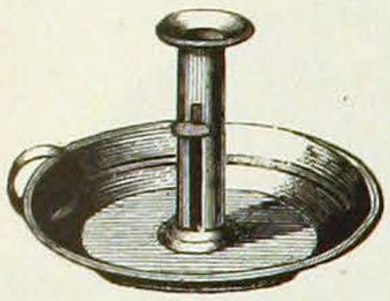
	Plain.		Japanned.	
No.	1	2	1	2
Diameter	5½	5	5½	5
Per doz.				



Save All Candlesticks.

NOT JAPANNED.

No.	1	2	3
Diameter	4½	5¾	7
Per doz.			



Deep Candlesticks.

No.	**1**	**2**	**1**	**2**
Diameter	7	6¼	7	6¼
Per doz.				



Box Graters.

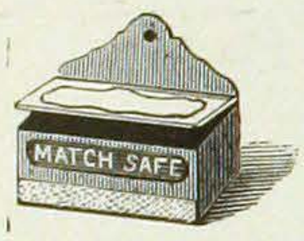
Per doz.



Cuspadores.

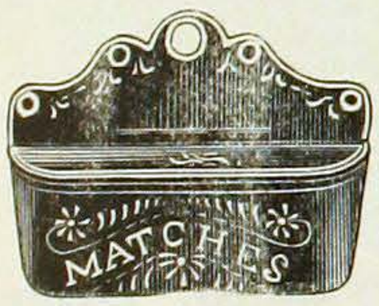
ASSORTED COLORS.

	SMALL.	MEDIUM.	LARGE.
Per doz.			



Square Match Safes.

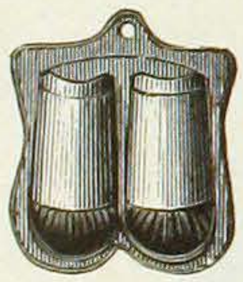
Sizes	**Small.**	**Large.**
Inches	3x2x1½	3¾x2¼x1½
Per doz.		



Self-Closing Match Safes.

DECORATED.

Inches	**4½x2x1⅝**
Per doz	



Twin Match Safes.

Inches	**4¼x5**
Per doz.	



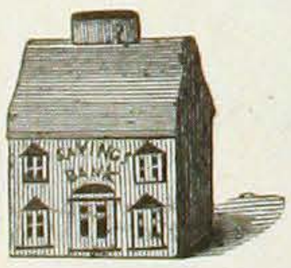
Toy Cups.

No.	**1**	**2**	**3**
Inches	2¼	2½	2¾
Per doz.			



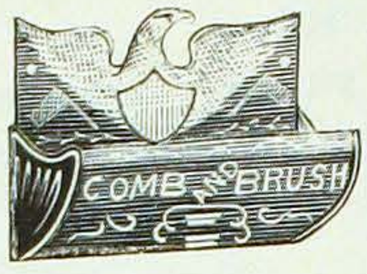
Toy Gothic Banks.

No.	**3**	**4**
Inches	3x1¾x1	4½x2⅜x1½
Per doz.		



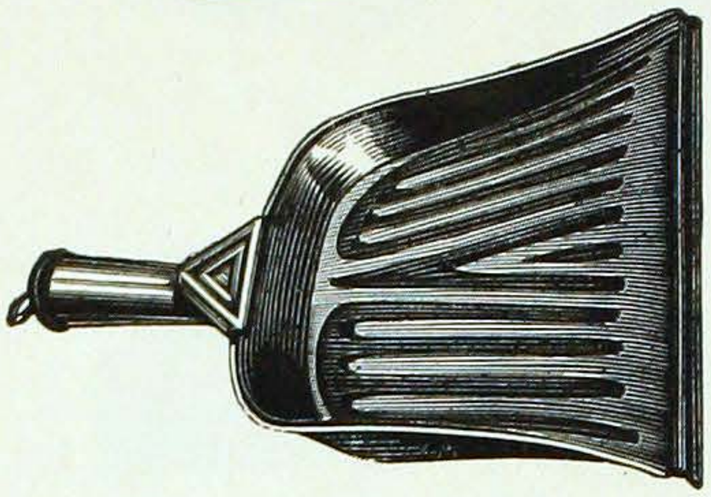
Toy House Banks.

No.	**1**	**2**
Inches	3½x2¾x1½	4¼x3½x2
Per doz.		



Comb Cases.

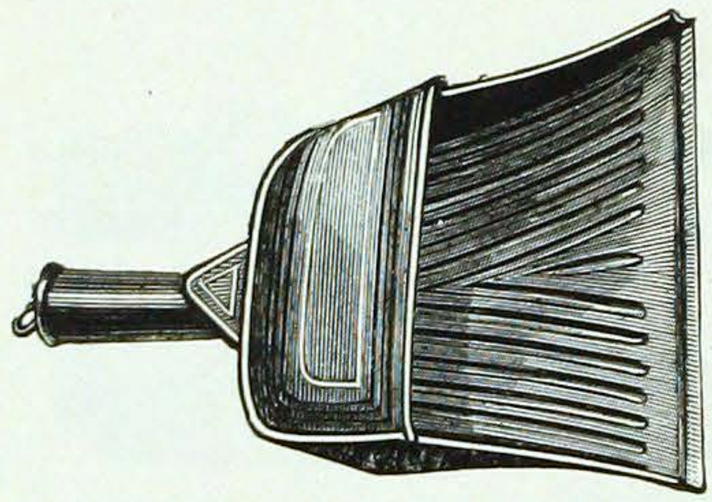
Per doz. . . . . .



Dust Pans.

Plain, Ic. IX. Japanned, IC. IX.

Per doz.



Half Covered Dust Pans.

IC. IX.

Per doz. . . . . .



Dredge Boxes.

	Plain.		Japanned.	
Sizes	**Small.**	**Large.**	**Small.**	**Large.**
Diameter .	2½	3	2½	3
Per doz. .				



Jacket Lamps.

2 Tubes and Feeders.

Sizes	**Small.**	**Large.**
Per doz.		



Pepper Boxes.

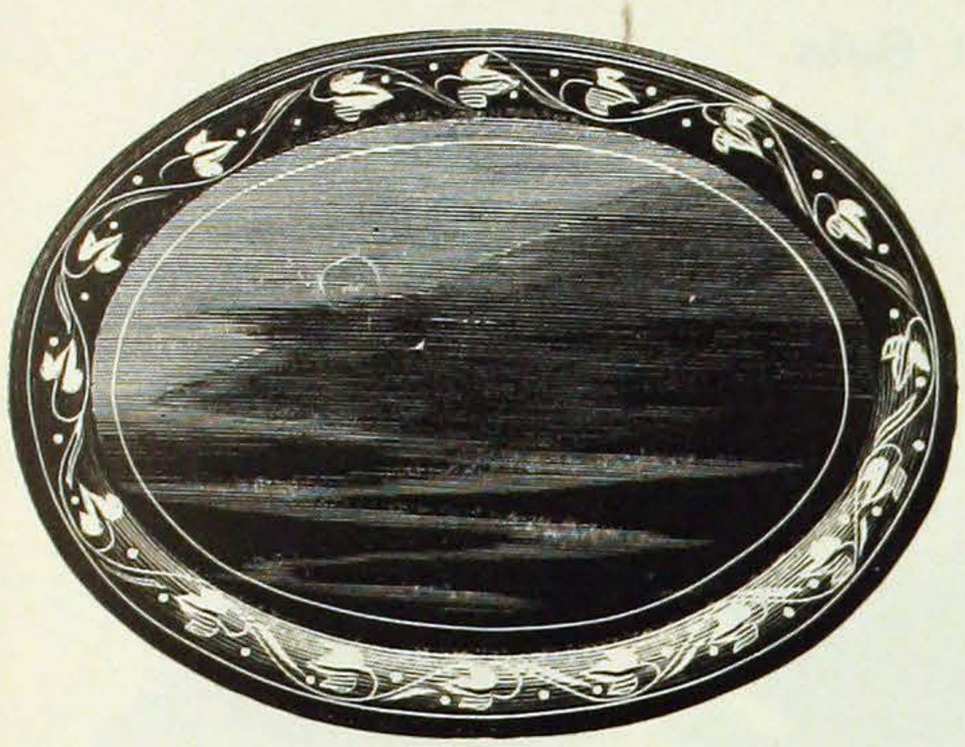
	Small.	**Large.**
Diameter	1½	1¾
Per doz.		



Scholar's Companion.

Square.

Per doz.



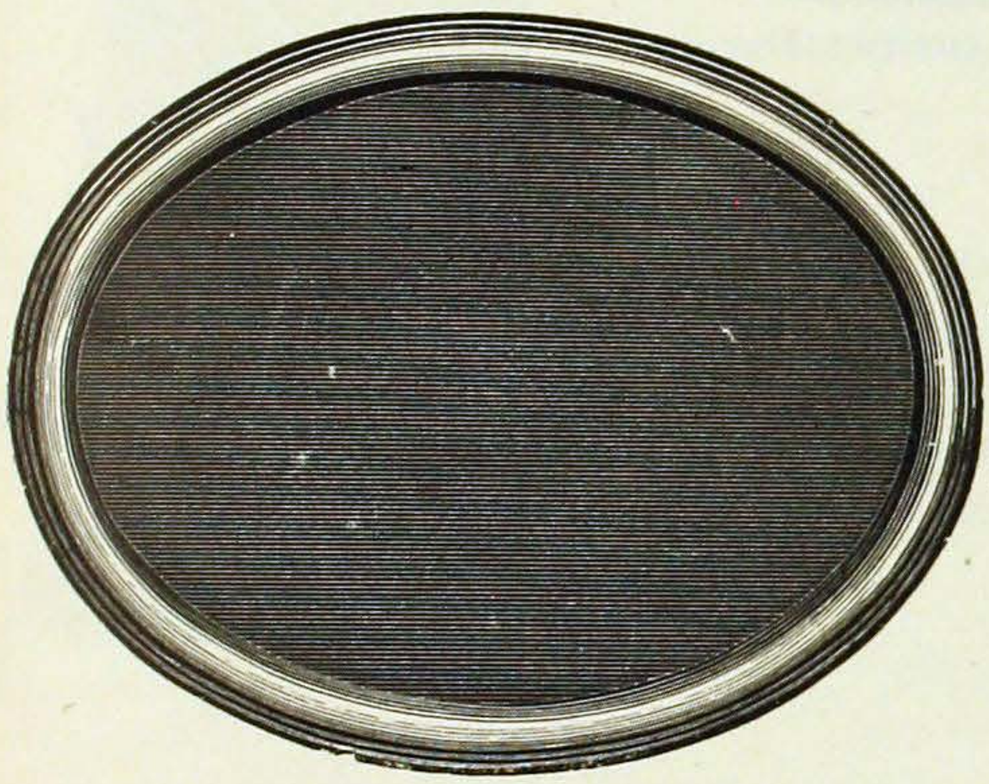
Trays.

No. 395. Leaf Decoration.

Inches	**12**	**14**	**16**	**18**	**20**
	$3.00	$3.50	$4.50	$5.50	$6.75

Inches	**22**	**24**	**26**	**28**
	$8.00	$10.00	$12.50	$15.00

Discount.....



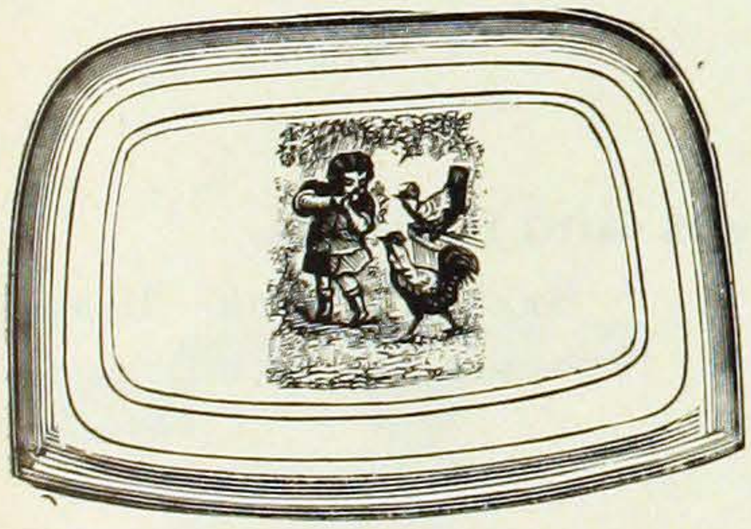
Trays.

No. 1201. Gold Band Decoration.

Inches	**12**	**14**	**16**	**18**	**20**
	$3.00	$3.50	$4.50	$5.50	$6.75

Inches	**22**	**24**	**26**	**28**
	8.00	$10.00	$12.50	$15.00

Discount.....



Child's Trays.

Fancy.

Per doz.

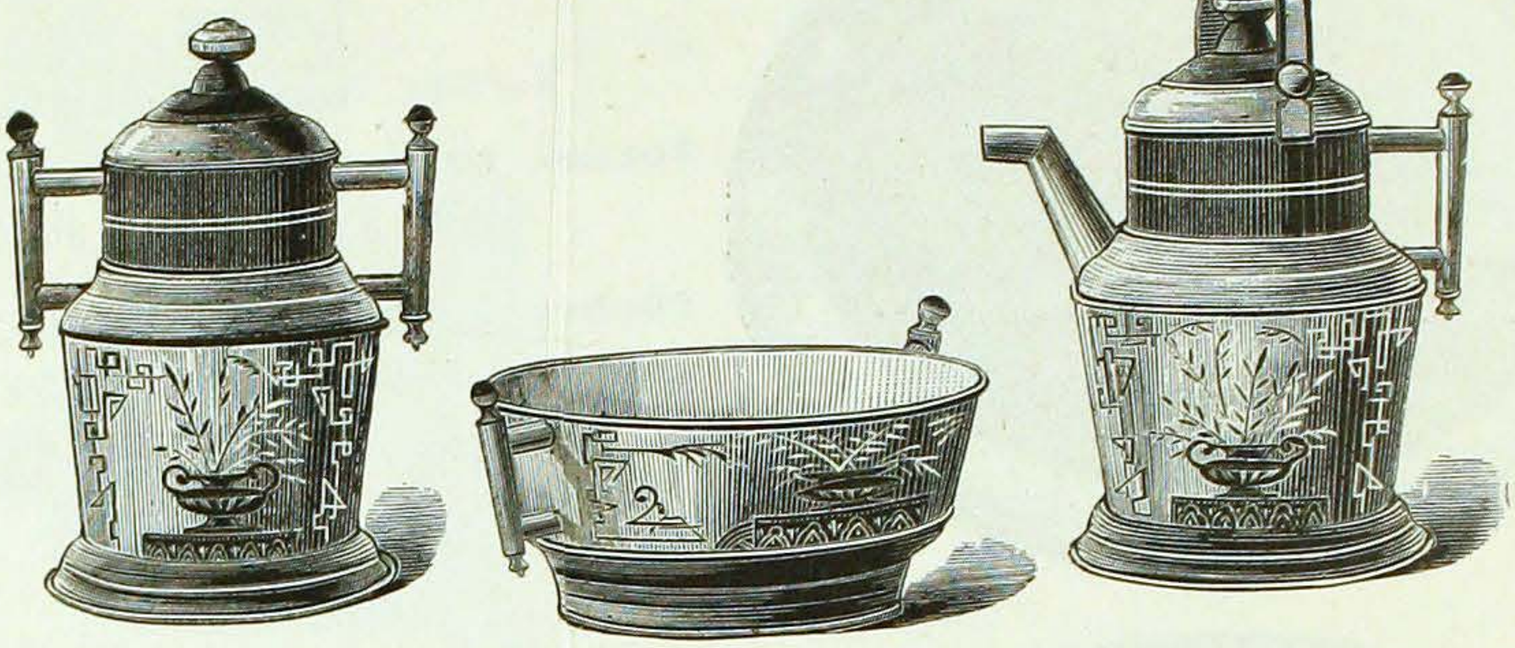


Child's Trays.

Extra Fancy.

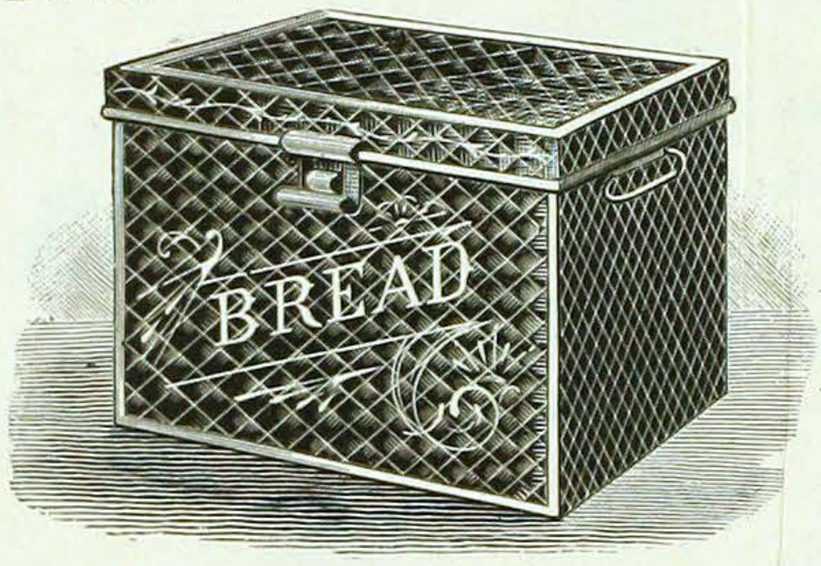
Per doz.

Toilet Sets.



NEW AND BEAUTIFUL DESIGNS.

Per set . . . . . .



Embossed Bread Boxes.

	SMALL.	MEDIUM.	LARGE.	NEST OF 3.
Dimen.	13x9¼x9¾	15x10¼x10¾	15¾x11⅜x12⅝	
Each .				



Bowls and Pitchers.

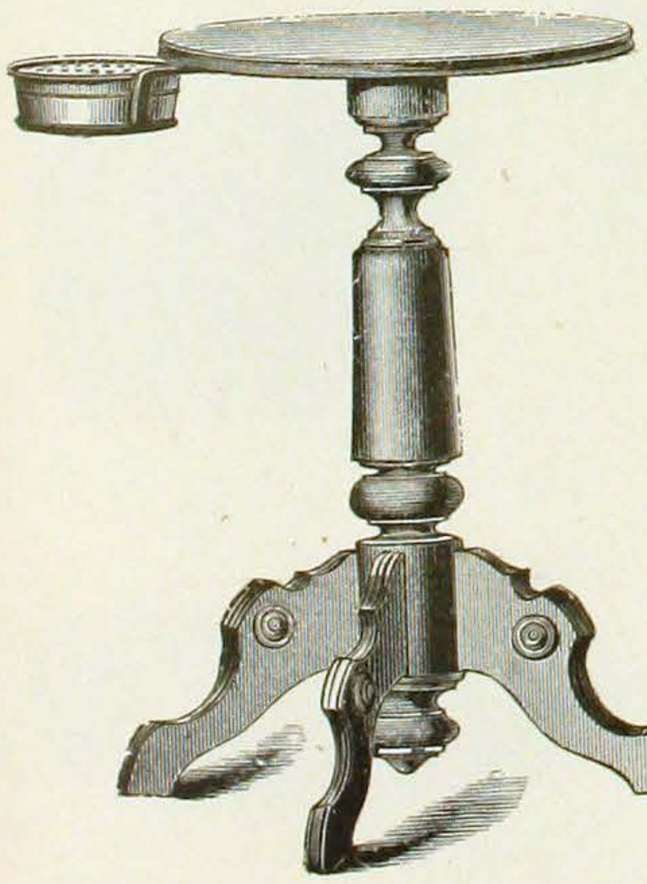
	SMALL.	MEDIUM.	LARGE.
Per doz. . . .			



Molasses Cups.

Pints	½	1	2	4
Per doz. . . .				





WATER COOLERS.

No. 606—Galvanized Iron Reservoirs.

Assorted colors. Neatly ornamented.

BRONZED LEVER FAUCETS.

2 Gallons $1.25

NICKEL-PLATED BRASS FAUCETS.

2 Gallons $1.41

Discount.....

No. 608—Galvanized Iron Reservoirs.

Fancy colors. Handsomely decorated.

FINE NICKEL-PLATED BRASS FAUCETS.

Gallons	**2**	**3**	**4**	**5**
Each	$2.50	$3.07	$3.62	$4.75

Discount.....

No. 610—Galvanized Iron Reservoirs.

Fancy colors. Artistic ornaments.

FINE NICKEL-PLATED BRASS FAUCETS.

Gallons	**2**	**3**	**4**	**5**	**6**	**8**	**10**
Each	$2.82	$3.37	$3.95	$5.07	$6.47	$7.87	$9.00

Discount.....

Enameled Reservoirs.

Rich colors. Artistic ornaments.

New iron breasts or tops to the reservoirs.

FINE NICKEL-PLATED BRASS FAUCETS.

Gallons	**2**	**3**	**4**	**6**
Each	$5.00	$6.20	$7.70	$10.00

Discount.....

Cooler Stands.

SOLID WALNUT THROUGHOUT.

The tops have a bead around the edge to prevent the cooler from slipping off.

The drip cup and holder can be easily detached from the stand, thus transforming it into a useful stand.

	14 inch.	16 inch.	18 inch.
Each	$2.75	$2.75	$3.00



HOLLOW WARE.



Round Enameled Boilers.

Pts.	**1½**	**2**	**3.**	**Qts.**	**2**	**2½**	**3**	**4**	**5**	**6**	**7.**
Each	.44	.48	.56.		.63	.68	.73	.84	.96	$1.11	$1.21

Gal.	**2**	**2½**	**3**	**3½**	**4**	**5**	**6**	**7**	**8**
Each	$1.31	$1.56	$1.70	$1.85	$2.00	$2.40	$3.00	$3.30	$3.80

Discount.....



Round Tinned Boilers.

Pts.	**1½**	**2**	**3**	**Qts.**	**2**	**2½**	**3**	**4**	**5**	**6**	**7**
Each	.44	.48	.56		.63	.68	.73	.84	.96	$1.11	$1.21

Gal.	**2**	**2½**	**3**	**3½**	**4**	**5**	**6**	**7**	**8**
Each	$1.31	$1.56	$1.70	$1.85	$2.00	$2.40	$3.00	$3.30	$.380

Discount.....



Round Plain Boilers.

Pts.	**1½**	**2**	**3**	**Qts.**	**2**	**2½**	**3**	**4**	**5**	**6**	**7**
Each	.32	.35	.42		.50	.53	.55	.60	.65	.70	.75

Gal.	**2**	**2½**	**3**	**3½**	**4**	**5**	**6**	**7**	**8**
Each	.85	$1.05	$1.20	$1.29	$1.35	$1.65	$1.85	$2.10	$2.35

Discount.....



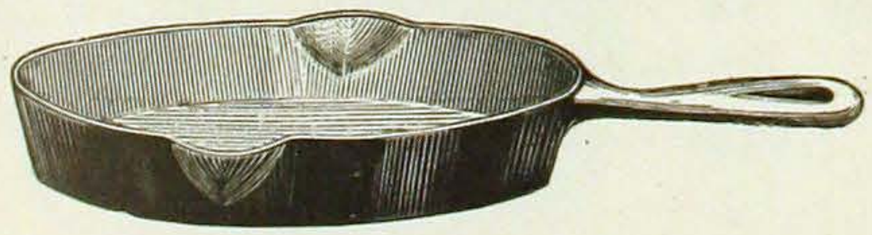
Round Turned Boilers.

Pts.	**1½**	**2**	**3**	**Qts.**	**2**	**2½**	**3**	**4**	**5**	**6**	**7**
Each	.37	.39	.47		.56	.59	.62	.68	.75	.81.	.84

Gal.	**2**	**2½**	**3**	**3½**	**4**	**5**	**6**	**7**	**8**
Each	.96	$1.18	$1.35	$1.47	$1.50	$1.90	$2.35	$2.80	$3.20

Lipped boilers same price as above.

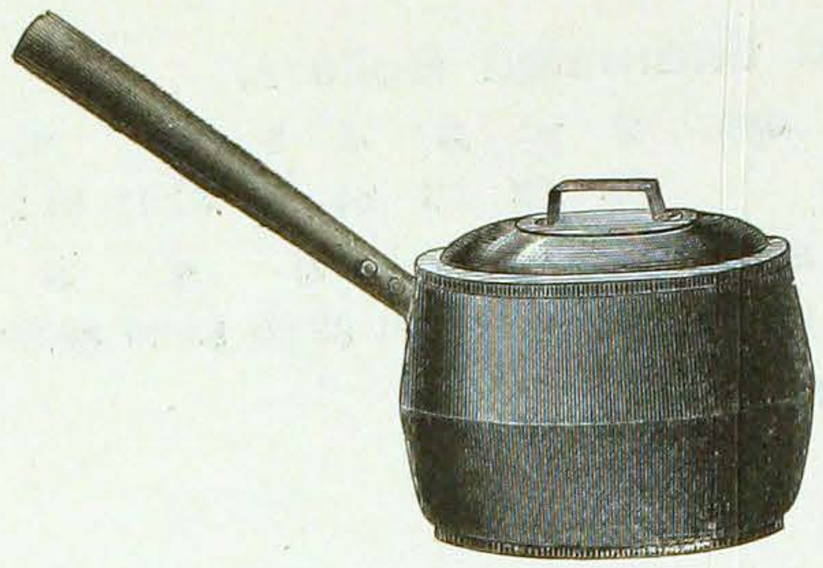
Discount.....



Cast Iron Spiders.

Inches	**6**	**7**	**8**	**9**	**10**	**11**
Each	.27	.30	.35	.40	.50	.60

Discount.....



Iron Saucepans.

ENAMELED.

Pts.	1	1½	2	3	Qts.	2	2½	3
Each	.39	.44	.48	.56		.63	.68	.73

Qts.	4	5	6	7	8	10	12	14
Each	.84	.96	$1.11	$1.21	$1.31	$1.56	$1.70	$1.85

Discount.....



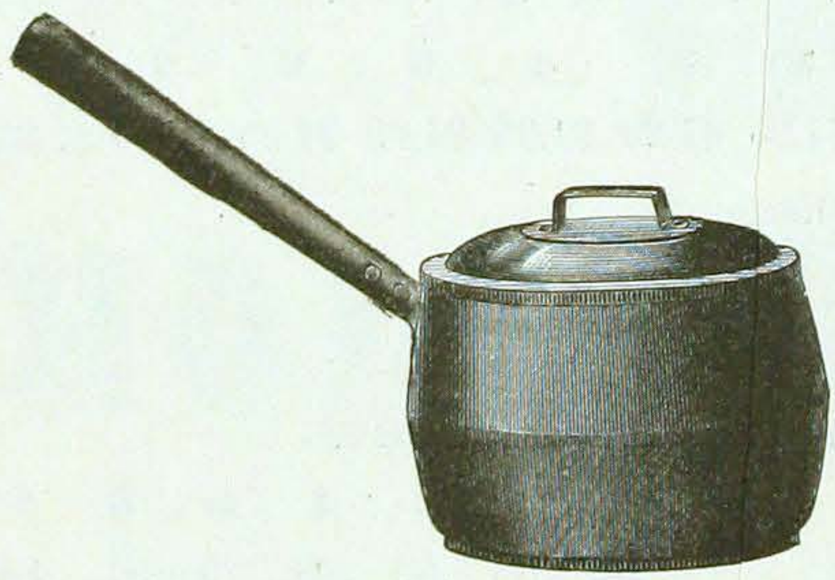
Iron Saucepans.

TINNED.

Pts.	1	1½	2	3	Qts.	2	2½	3
Each	.39	.44	.48	.56		.63	.68	.73

Qts.	4	5	6	7	8	10	12	14
Each	.84	.96	$1.11	$1.21	$1.31	$1.56	$1.70	$1.85

Discount.....



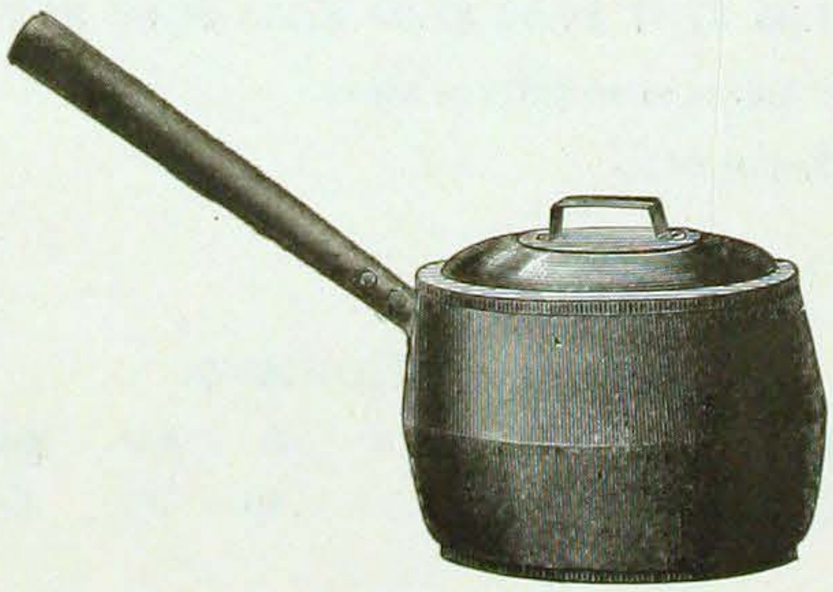
Iron Saucepans.

PLAIN.

Pts.	1	1½	2	3	Qts.	2	2½	3
Each	.30	.32	.35	.42		.50	.53	.55

Qts.	4	5	6	7	8	10	12	14
Each	.60	.65	.70	.75	.85	$1.05	$1.20	$1.29

Discount.....



Iron Saucepans.

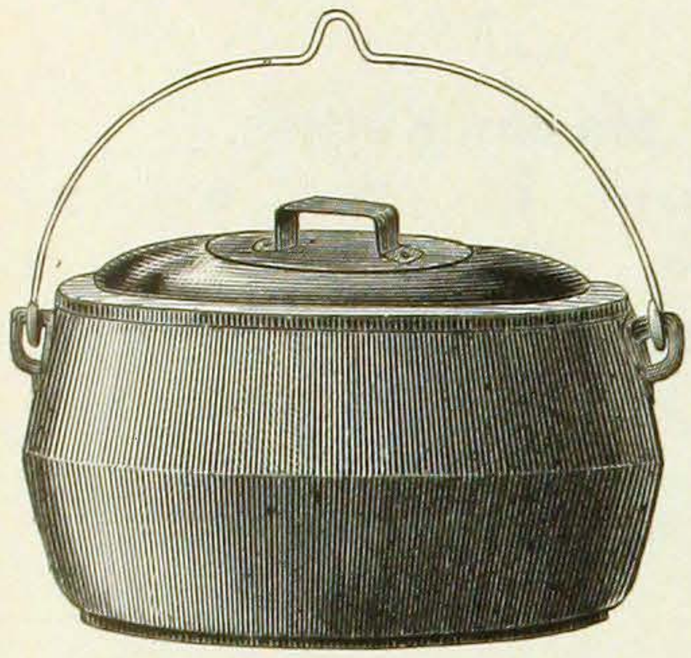
TURNED.

Pts.	1	1½	2	3	Qts.	2	2½	3
Each	.35	.37	.39	.47		.56	.59	.62

Qts.	4	5	6	7	8	10	12	14
Each	.68	.75	.81	.84	.96	$1.18	$1.35	$1.47

Discount.....

Lipped saucepans same price as above.

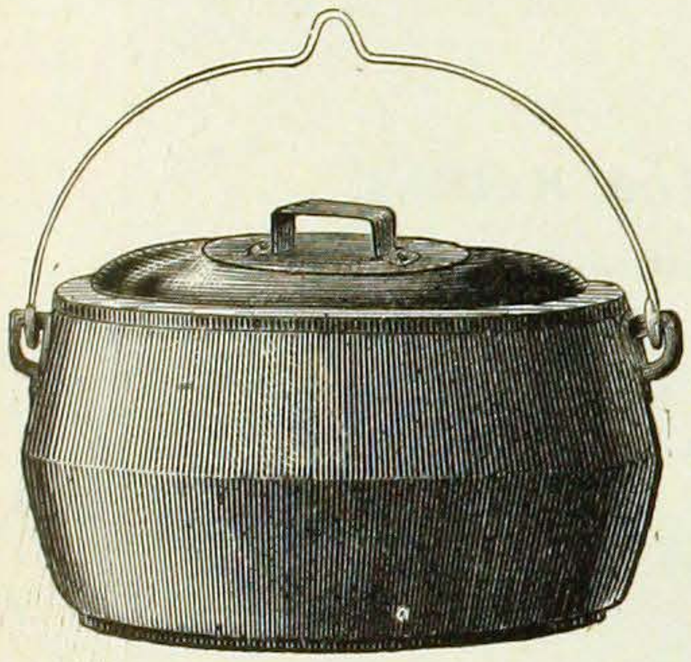


Flat Bottom Oval Boilers.

TINNED.

Gals.	**1**	**1½**	**2**	**2½**	**3**	**3½**
Each	$1.08	$1.28	$1.50	$1.65	$1.90	$2.20
Gals.	**4**	**5**	**6**	**7**	**8**	**10**
Eaeh	$2.50	$2.90	$3.30	$4.00	$4.80	$5.90

Discount.....



Flat Bottom Oval Boilers.

ENAMELED.

Gals.	**1**	**1½**	**2**	**2½**	**3**	**3½**
Each	$1.08	$1.28	$1.50	$1.65	$1.90	$2.20
Gals.	**4**	**5**	**6**	**7**	**8**	**10**
Each	$2.50	$2.90	$3.30	$4.00	$4.80	$5.90

Discount.....

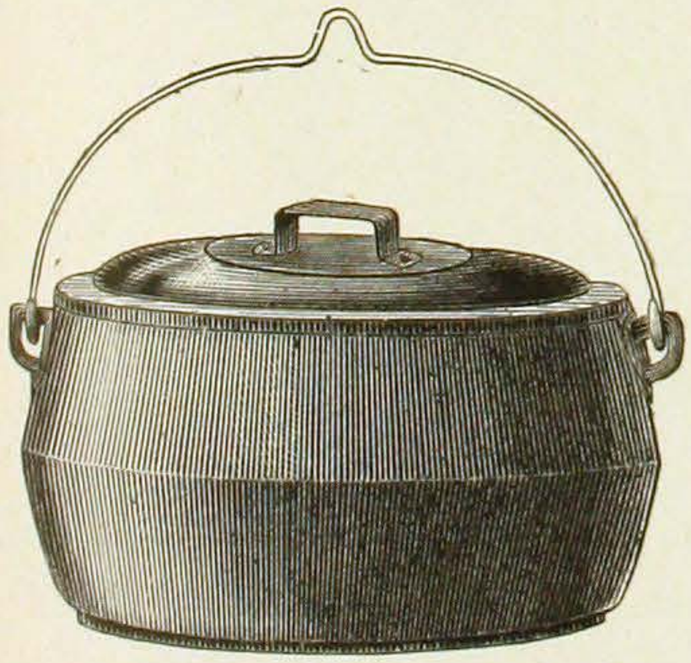


Flat Bottom Oval Boilers.

PLAIN.

Gals.		**1**	**1½**	**2**	**2½**	**3**	**3½**
Each		.70	.80	.90	$1.15	$1.30	$1.40
Gals.	**4**		**5**	**6**	**7**	**8**	**10**
Each	$1.55		$1.75	$2.00	$2.30	$2.60	$3.10

Discount.....



Flat Bottom Oval Boilers.

TURNED.

Gals.		**1**	**1½**	**2**	**2½**	**3**	**3½**
Each		.78	.89	$1.02	$1.27	$1.45	$1.57
Gals.	**4**		**5**	**6**	**7**	**8**	**10**
Each	$1.73		$1.96	$2.25	$2.55	$2.85	$3.36

Discount.....



Enameled Maslin Kettles.

Qts.	**2**	**3**	**3½**	**4**	**5**	**6**	**7**
Each	.45	.60	.68	.75	.90	$1.10	$1.20

Qts.	**8**	**10**	**12**	**14**	**16**	**20**	**24**
Each	$1.30	$1.40	$1.50	$1.75	$2.00	$2.50	$3.00

Discount.....

Lipped maslin kettles same price as above.



Iron Tea Kettles.

JAPANNED.

FLAT OR SUNK.

Inches	**6**	**7**	**8**	**9**	**10**
Each . . .					

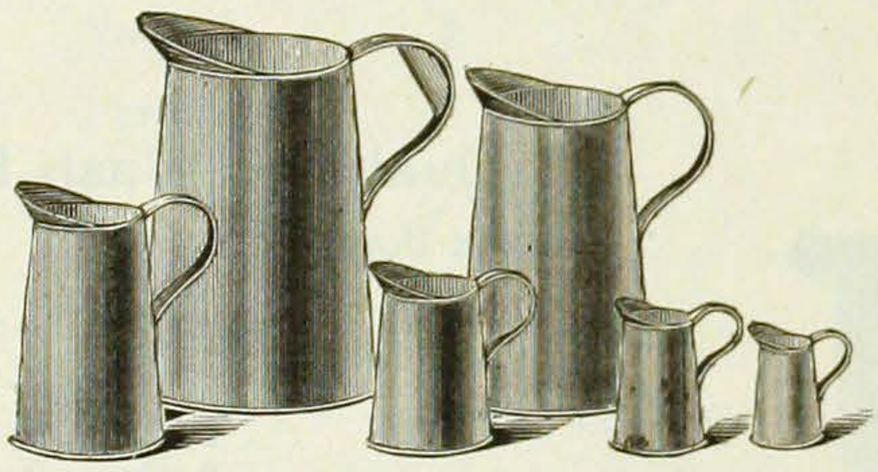


Iron Tea Kettles.

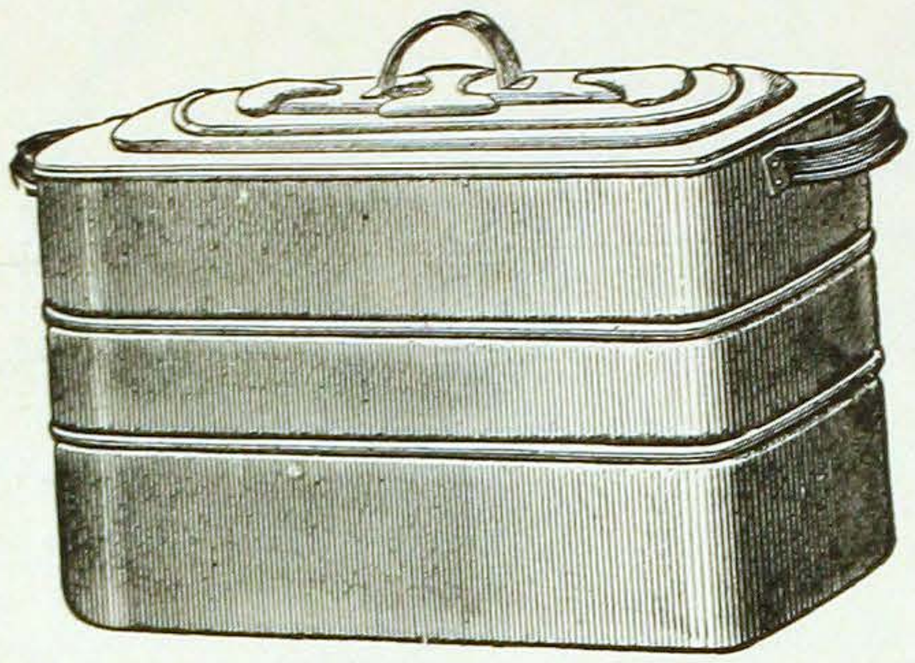
GALVANIZED.

FLAT OR SUNK.

Inches	**6**	**7**	**8**	**9**	**10**
Each . . .					



PIECED WARE.



Oblong Wash Boilers.

	Copper Bottom.	Each.
6 inch	. . . . .	$2.25
7 "	. . . . .	2.50
8 "	. . . . .	2.75
9 "	. . . . .	3.00
10 "	. . . . .	3.50

Discount.....

	Metallic Bottom.	Each.
6 inch	. . . . .	$1.75
7 "	. . . . .	2.00
8 "	. . . . .	2.25
9 "	. . . . .	2.50
10 "	. . . . .	3.00

Discount.....



Oval End Wash Boilers.

Copper Bottom.	Each.
6 inch . . .	$2.25
7 " . . .	2.50
8 " . . .	2.75
9 " . . .	3.00
10 " . . .	3.50

Discount.....

Metallic Bottom.	Each.
6 inch . . .	$1.75
7 " . . .	2.00
8 " . . .	2.25
9 " . . .	2.50
10 " . . .	3.00

Discount.....

Round and Oval Wash Kettles.

No.	**1**	**2**	**3**	**4**
Each	.50	.60	.70	.80

Discount.....



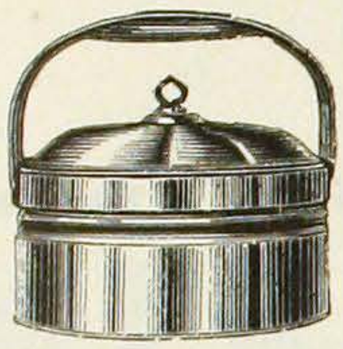
IC Dish Pans.

Qts.	**8**	**10**	**11**	**12**	**14**	**16**
Per doz.						



Covered Buckets.

Qts.	½	1	1½	2	3	4	6	8	10	12	14	16	20
Per doz.													



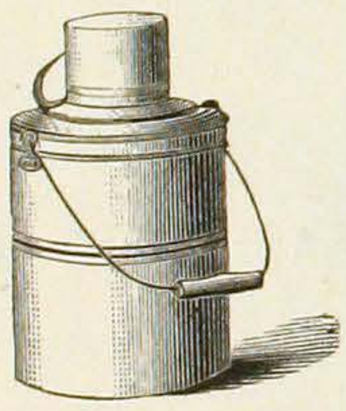
Kettles, Butter.

No.	**00**	**0**	**1**	**2**	**3**	**4**
Per doz.						



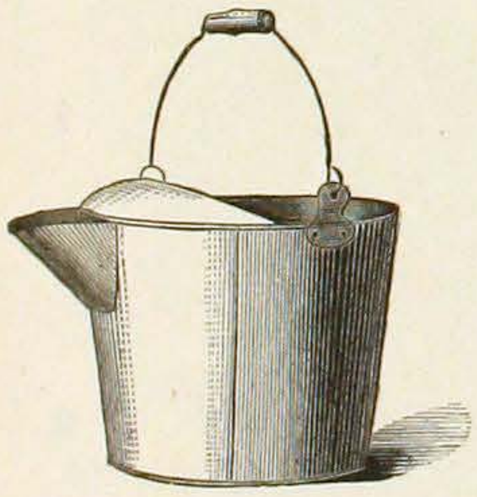
Oval Dinner Pails.

Nos.	**1**	**2**	**3**	**4**
Per doz.				



Round Dinner Pails.

Small (2 qts.)	**Large (3 qts.)**	**Ex. Large (4 qts.)**
Per doz.		



Milk Pails.

With Strainers.

Qts.	**6**	**10**	**12**	**14**
Per doz.				



Common Measures.

Gill	**½ Pt.**	**Pt.**	**Qt.**
Per doz.			



Lipped Measures.

	Gill	½ Pt.	Pt.	Qt.	½ Gal.	1 Gal.
Per doz.						



Coffee Boilers.

Qts.	1	1½	2	3	4	6	8	10	12
Per doz.									



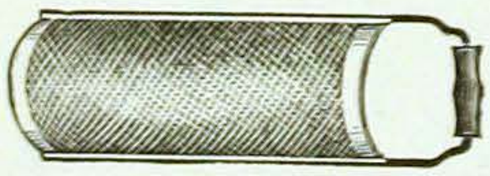
Octagon Tea Pots.

Pints	1	2	3	4	5	6	8
Per doz. Plain Spout							
Per doz. Fancy Spout							



Coffee Flasks.

Pints	1	1½	2
Per doz.			



Flat Graters.

Sheet	¼	½	1
Per doz.			



Cups.

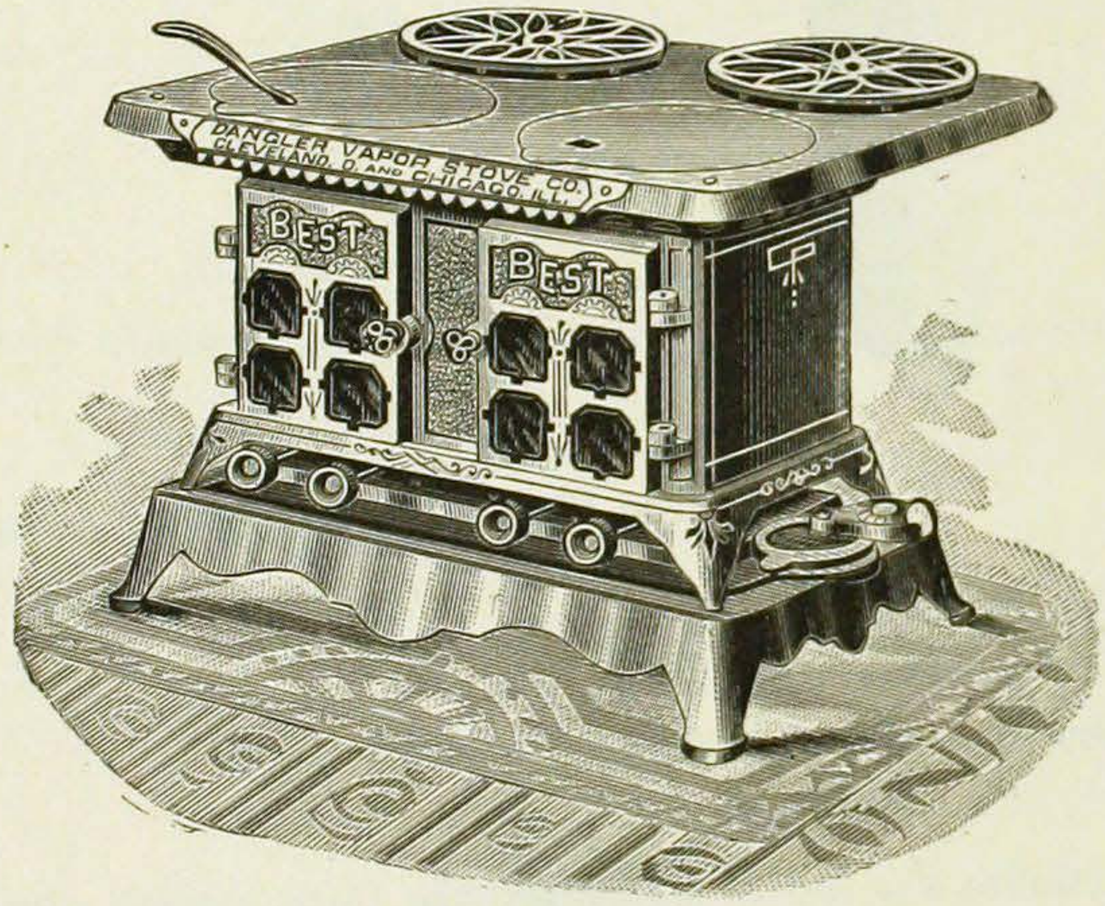
Pints	½	1	2
Per doz.			



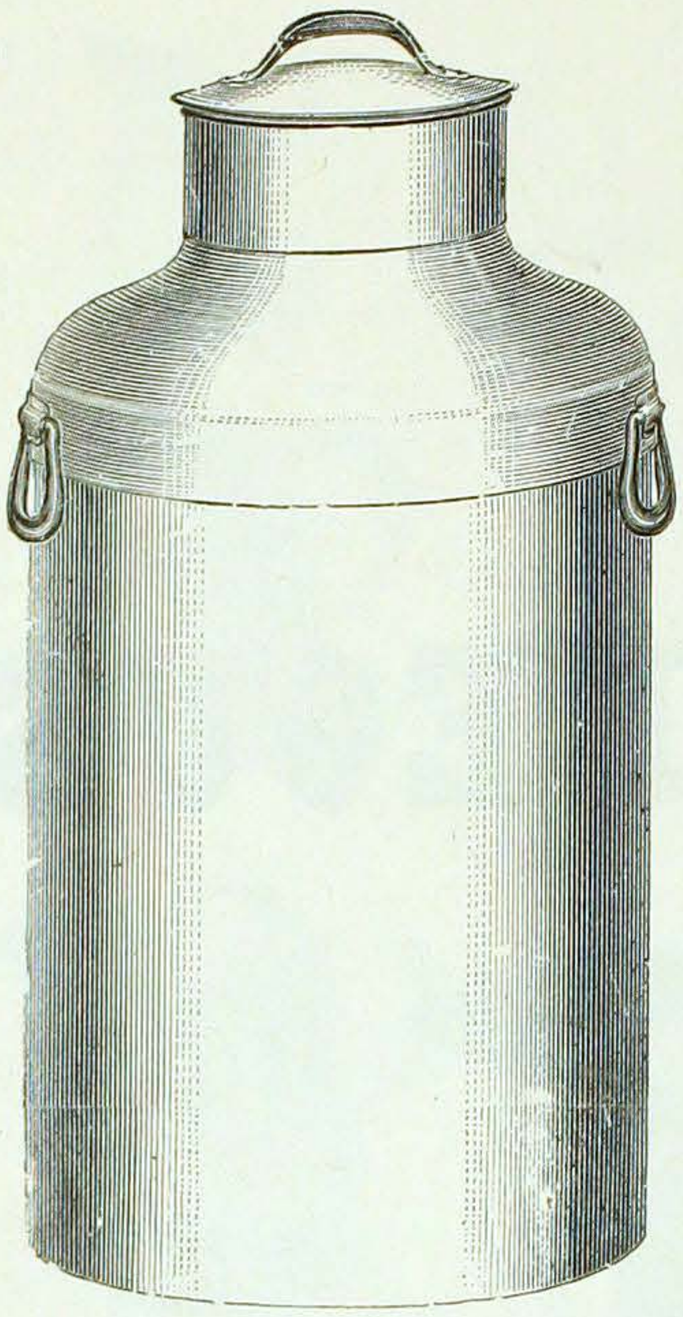
Gravy Strainers.

No.	Tin Handle.	Wood Handle.
	2	20
Per doz.		

MISCELLANEOUS



GOODS.



Philadelphia Pattern Railroad Milk Cans.

DRY MEASURE.

No. 1.	40 quart	each	$5.00
No. 1.	30 quart	each	4.50
No. 1.	20 quart	each	4.00

Discount.....per cent.

Stock Complete.

40 quart, No. 1, Dry Measure	per set	$3.75
30 quart, No. 1, Dry Measure	per set	3.50
20 quart, No. 1, Dry Measure	per set	2.75

Discount.....per cent.

The above includes the entire Stock for the Cans, except the cover rims, neck pieces, and cover handle.

The 30 quart Cans are made with the same trimmings as the 40 quart, with a shorter cylinder.



Bottoms.

40 quart, 13 inch . . .	per dozen	$9.00
30 quart, 13 inch . . .	per dozen	9.00
20 quart, 10¼ inch . .	per dozen	6.00

Discount.....per cent.

Black Bottom Hoops.

For Reversed Bottom Can.

40 quart	per dozen $1.75
30 quart	per dozen 1.75
20 quart	per dozen 1.50

Discount.....per cent.

Breast and Hoop Combined.



40 quart, 13 inch	per dozen $12.00
30 quart, 13 inch	per dozen 12.00
20 quart, 10¼ inch	per dozen 7.50

Discount.....per cent.

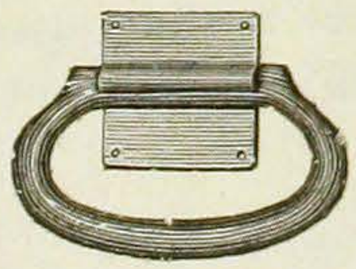
These Breasts are stamped from one piece of iron, as shown in cut, and *retinned*.

Blanks for Cover Tops.

8 inch, for 40 and 30 quart Cans	per dozen $1.75
7 inch, for 20 quart Cans	per dozen 1.50

Discount.....per cent.

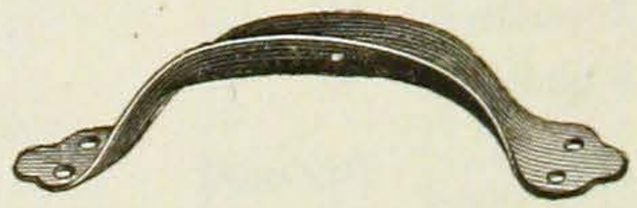
Guard Handles and Ears.



Per pair ..... 15 cents.

Discount.....per cent.

Stamped Cover Handles.

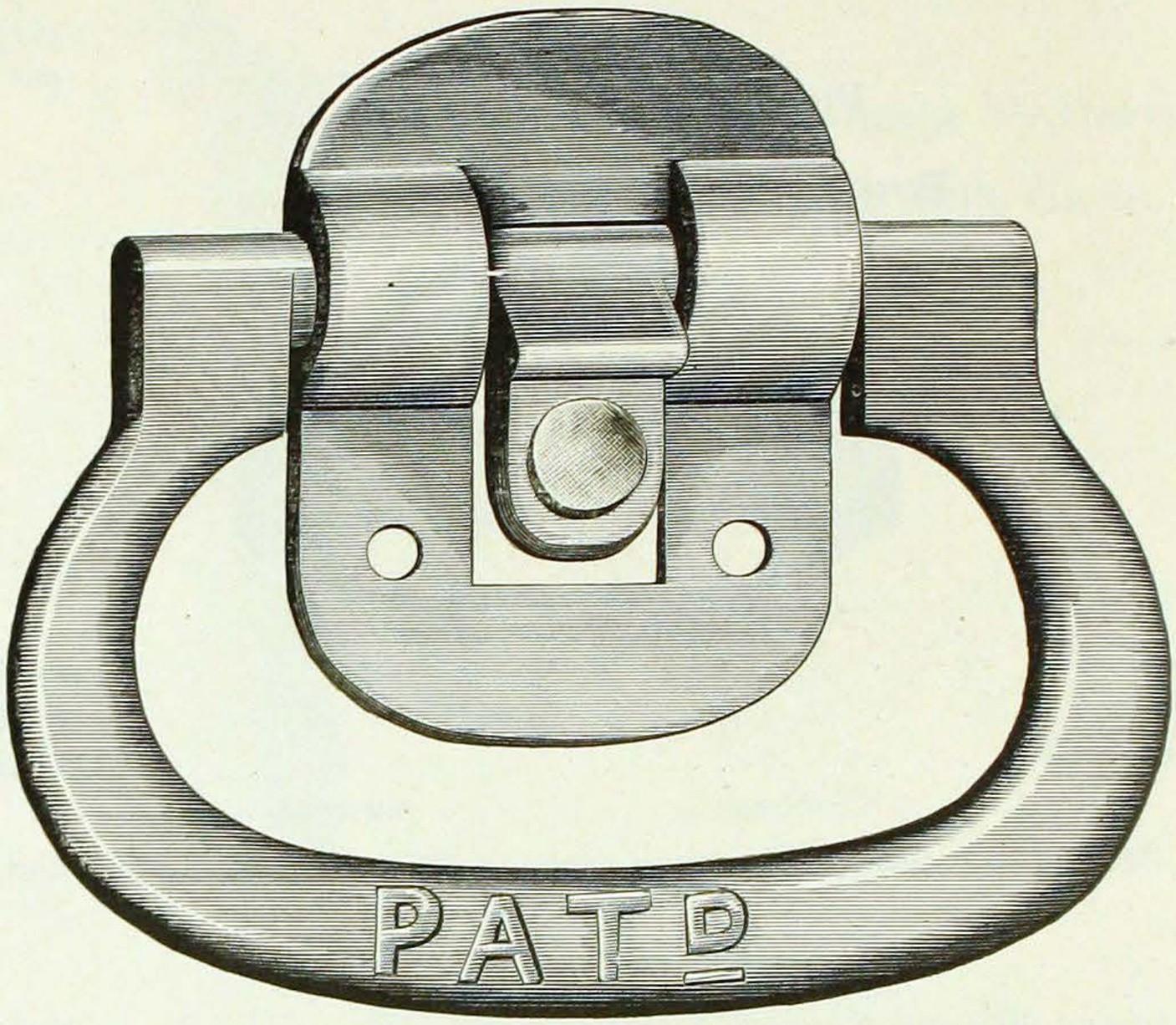


No. 1, for 30 and 40 quart cans	per dozen pairs $1.50
No. 2, for 20 quart cans	per dozen pairs 1.00

Discount.....per cent.

The Noiseless Milk Can Handle.

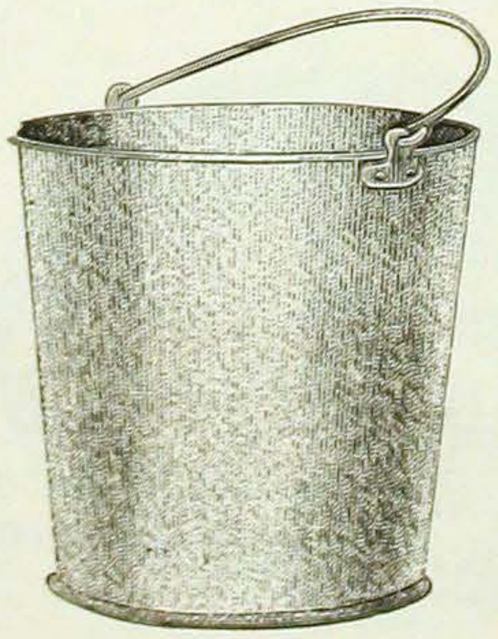
PATENTED MARCH 18, 1884.



The above cut represents the exact size of our new Milk Can Handle. We claim that it is in every respect the strongest and best handle ever offered. It is made of malleable iron, and is rendered absolutely noiseless by the rubber plug.

It is a well-known fact that the rattling noise of a milk can is produced by the handles striking the body of the can; this great objection is entirely overcome by the use of the Noiseless Handle.

Price . . . . . per pair, 25 cents.



Galvanized Fire Buckets.

10 quart	per dozen $4.50
12 quart	per dozen 5.00
14 quart	per dozen 5.50

Discount.....per cent.

These Pails, as represented in the cuts, are put together in the black, after which they are galvanized.



Retinned Iron Clad Milk or Water Pails.

HEAVY.

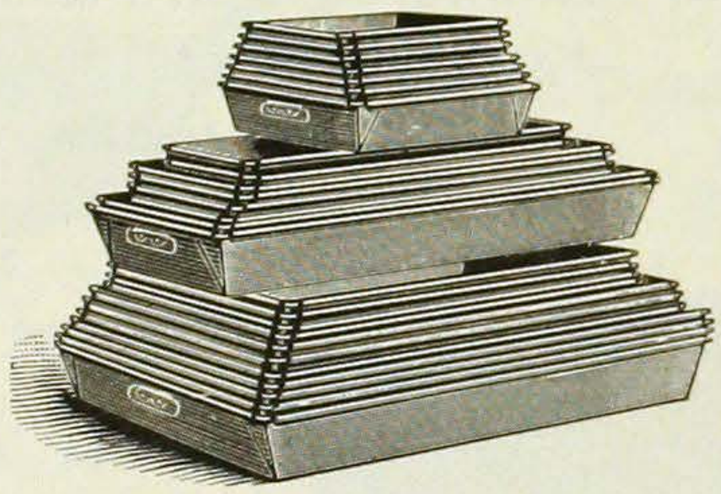
10 quart (8¼ inch bottom) . . . per dozen $10.50
14 quart (9¼ inch bottom) . . . per dozen 12.00

Discount.....per cent.

We call particular attention to the above Pail, as it is superior to anything of the kind heretofore manufactured. They are put together of black iron (the cylinder being of one piece, and much heavier than the common stock used for such purposes) and retinned, making them as one solid piece.

By this process, and with improved machinery by which they are put together, we are enabled to furnish a *very* durable Pail at a low Price.

Dripping Pans.



Made of the best smooth iron, and absolutely first-class in every respect.

SIZES, NUMBER OF DOZEN TO CRATE AND CASE, AND APPROXIMATE WEIGHT PER DOZEN.

Size.	Doz. in Crate.	Doz. in Case.	Weight per doz. lbs.	Size.	Doz. in Crate.	Doz. in Case.	Weight per doz. lbs.
6 x 9	4	24	8	10x15	4	10	19
6½x 7¾	4	24	8	10x16	4	10	19½
6½x13	4	15	13	10x19	3	6	23
7 x 8	4	24	8	11x11	4	6	15
7½x 9	4	24	10	11x15	4	9	19½
7 x10	4	24	10½	11x16	4	10	21
7 x14	4	15	14	12x12	4	12	17½
8 x10	4	24	10	12x17	3	6	24
8 x12	4	15	13½	12x20	3	6	26
8 x17	4	12	18	13x13	4	9	20
8½x15	4	12	16	14x14	4	6	22
9 x12	4	15	15	14x15	3	9	23
9½x16½	4	10	18	16x17	3	6	28
10 x14	4	12	17½	18x19	3	4	34½

Price,.....per lb.

Round Hammered Iron Pans.

ENGLISH PATTERN.



Inches	6	7	8	9
	x2	x2	x2	x2
Bottom meas. in inches.	$4\frac{1}{4}$	$5\frac{1}{4}$	$5\frac{3}{4}$	$6\frac{3}{4}$
Per pound				

Inches	10	11	12
	x2	x$2\frac{1}{4}$	x$2\frac{1}{4}$
Bottom meas. in inches.	$7\frac{3}{4}$	$8\frac{1}{2}$	$9\frac{1}{4}$
Per pound			

Oval Hammered Iron Pans.

ENGLISH PATTERN.

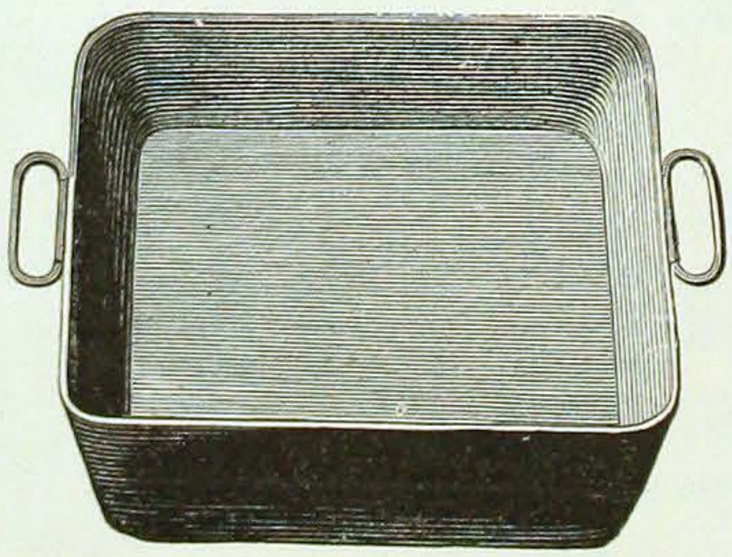


Inches	9	10	11	12
	x	x	x	x
	$7\frac{5}{8}$x$2\frac{1}{8}$	$8\frac{3}{4}$x$2\frac{1}{4}$	$9\frac{1}{2}$x$2\frac{1}{2}$	$10\frac{3}{4}$x$2\frac{7}{8}$
Per pound				

Inches	13	14	15	16
	x	x	x	x
	$11\frac{1}{2}$x$3\frac{1}{4}$	$12\frac{1}{4}$x$3\frac{1}{4}$	13x$3\frac{1}{4}$	$13\frac{7}{8}$x$3\frac{1}{2}$
Per pound				

Inches	17	18	20
	x	x	x
	$14\frac{3}{4}$x$3\frac{1}{2}$	$15\frac{3}{4}$x$3\frac{7}{8}$	$17\frac{1}{2}$x$4\frac{1}{4}$
Per pound			

Bright Iron "Favorite" Seamless Square Iron Pans.

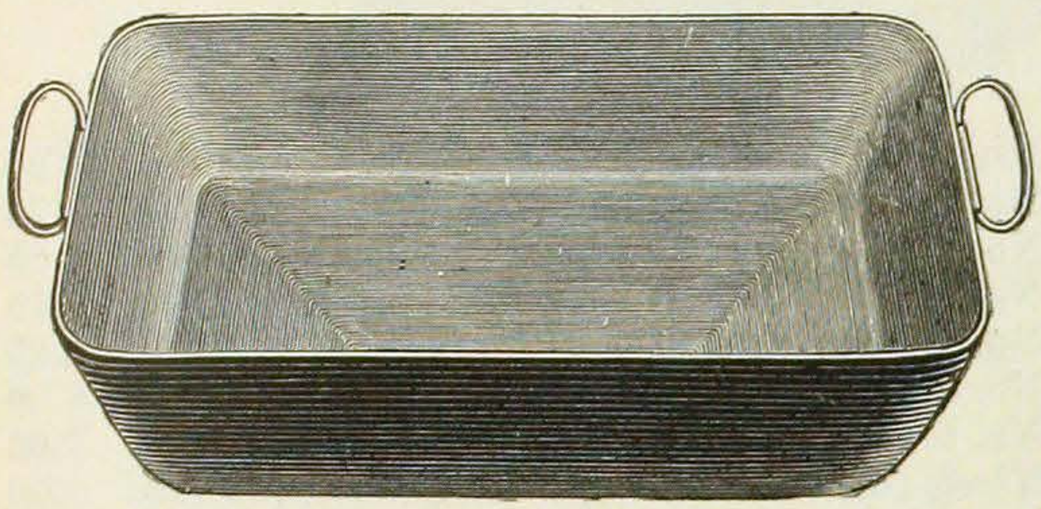


Inches	10	11	12	13
	x	x	x	x
	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{2}$
Polish'd, per pound				

Inches	14	15	18
	x	x	x
	$2\frac{1}{2}$	$2\frac{3}{4}$	$2\frac{3}{4}$
Polish'd, per pound			

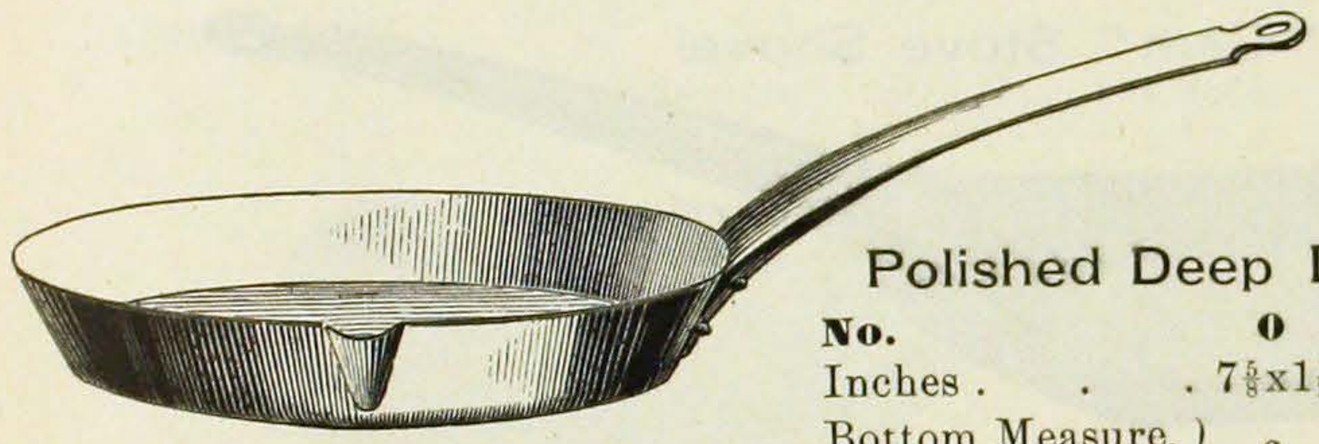
Bright Iron "Favorite" Seamless Oblong Iron Pans.

American Pattern.



Inches	**13** x **9x2½**	**14** x **9½x2½**	**15** x **10½x2½**
Bright Iron, per pound			

Inches	**16** x **11x2½**	**18** x **12½x2¾**	**20** x **13½x2¾**
Bright Iron, per pound			

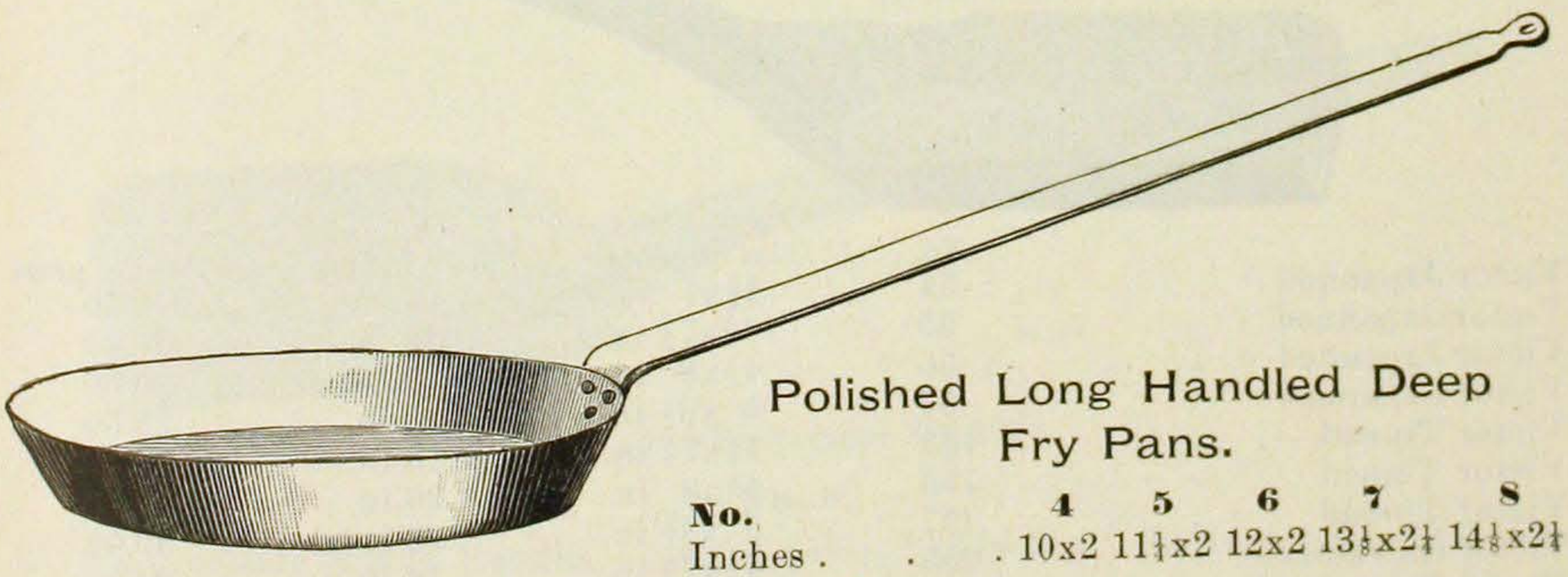


Polished Deep Lipped Fry Pans.

No.	**0**	**1**	**2**	**3**	**4**
Inches . . .	7⅝x1½	8½x1¾	9x1¾	9⅜x1¾	10x2
Bottom Measure, in Inches.	6	6½	7	7½	8
Polished, per doz.	$1.50	$1.75	$2.00	$2.25	$2.50

No.	**5**	**6**	**7**	**8**
Inches . . .	11¼x2	12x2	13⅛x2¼	14⅛x2¼
Bottom Measure, in Inches.	9	10	10½	11½
Polished, per doz.	$2.75	$3.25	$3.75	$4.25

Discount.....



Polished Long Handled Deep Fry Pans.

No.	**4**	**5**	**6**	**7**	**8**
Inches . . .	10x2	11¼x2	12x2	13⅛x2¼	14⅛x2¼
Bottom Measure, in Inches.	8	9	10	10½	11½
Handle, Inches .	23	27½	30	35	38¾
Polished, per doz.	$5.00	$5.50	$6.50	$7.50	$8.50

Discount.....



Patent "Acme" Fry Pans.

DEEP, POLISHED, LIPPED.

No. 0, (diameter at top 8 inches), per doz.		$3.00
No. 1, (diameter at top 8½ inches), per doz.		3.75
No. 2, (diameter at top 9 inches), per doz.		4.25
No. 3, (diameter at top 9½ inches), per doz.		4.75
No. 4, (diameter at top 10 inches), per doz.		5.25
No. 5, (diameter at top 11 inches), per doz.		6.00
No. 6, (diameter at top 12 inches), per doz.		7.00
No. 7, (diameter at top 13 inches), per doz.		8.00

Discount.....

"Gem" Stove Shovel.



	No.	Size of Scoop.	Entire length.	Price per gross.
Gem Japanned . . .	15	4¾x7½ in.	16 in.	$15.00
Gem Japanned . . .	20	5 x8 in.	17 in.	18.00
Gem Japanned . . .	22	4¾x8 in.	18½ in.	19.00
Gem Japanned . . .	25	5 x8 in.	23 in.	25.00

Discount.....

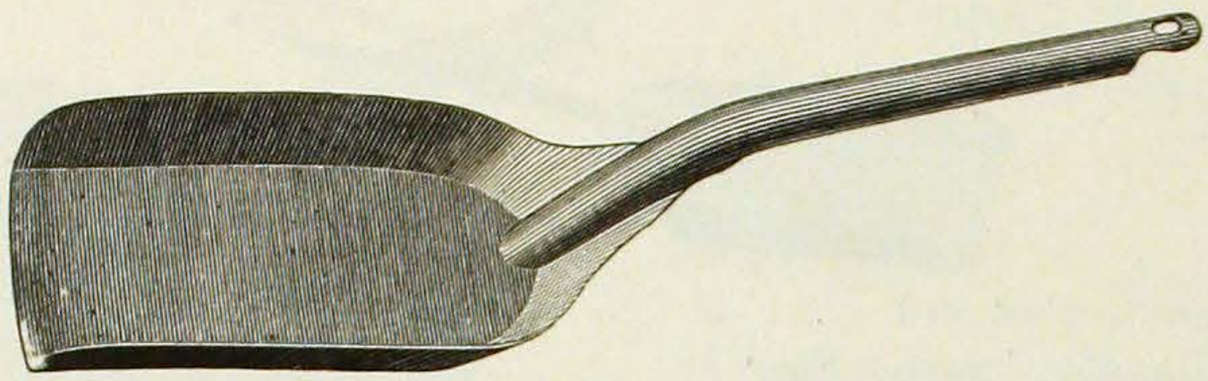
"Victor" Stove Shovel.



	No.	Size of Scoop.	Entire Length.	Price per gross.
Victor Japanned . . .	54	4¾x7 in.	15 in.	$13.50
Victor Japanned . . .	55	4¾x7½ in.	16 in.	16.00
Victor Japanned . . .	56	4¾x8 in.	20 in.	20.00
Victor Japanned . . .	57	5 x8½ in.	23 in.	25.00
Victor Tinned . . .	155	4¾x7½ in.	16 in.	24.00
Victor Tinned . . .	156	4¾x8 in.	20 in.	35.00
Victor Tinned . . .	157	5 x8½ in.	23 in.	40.00
Victor Galvanized . . .	255	4¾x7½ in.	16 in.	21.00
Victor Galvanized . . .	256	4¾x8 in.	20 in.	30.00
Victor Galvanized . . .	257	5 x8½ in.	23 in.	35.00
Climax Japanned . . .	70	4¾x7 in.	15 in.	10.50
Vulcan Japanned . . .	80	4¾x7 in.	15 in.	10.00

Discount.....

Iron Clad Fire Shovels.



Patented September 12, 1876.

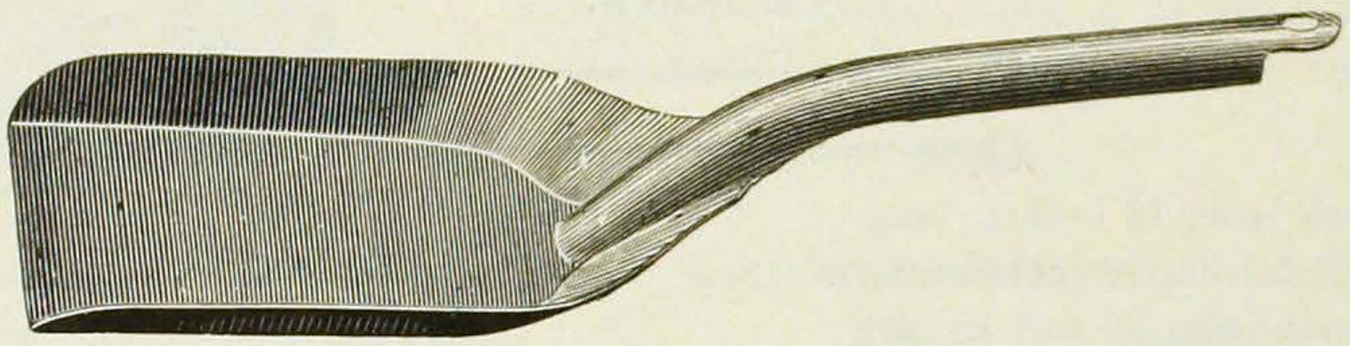
No. 2.

Size of Scoop, 4½x7 inches. Entire length, 15 inches.

This Shovel is made from No. 24 Gauge Iron, stamped from one piece, the same as the No. 5, and is an A No. 1 Shovel at the price.

Japanned . . . . . per gross $11.00

Discount..... per cent.



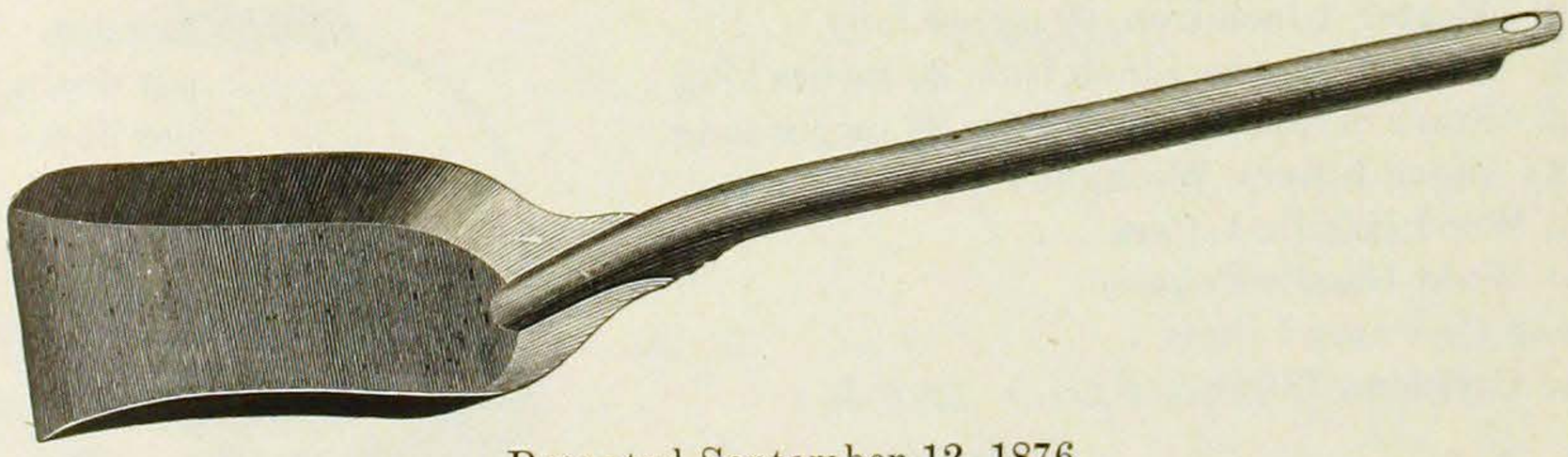
Patented September 12, 1876.

No. 5.

Size of Scoop, 4¾x8 inches. Entire length, 16 inches.

Japanned	per gross $15.00
Galvanized	per gross 21.00
Tinned	per gross 24.00

Discount..... per cent.



Patented September 12, 1876.

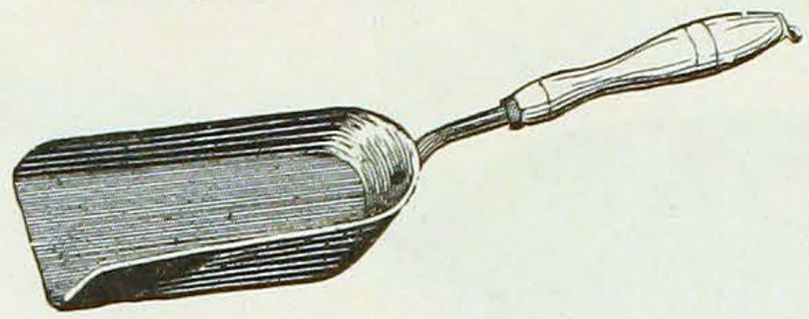
No. 7.

With a Perfectly Round Handle. Size of Scoop, 5x8 inches. Entire length, 23 inches.

Japanned	per gross $25.00
Galvanized	per gross 35.00
Tinned	per gross 40.00

Discount..... per cent.

Stove Shovels.

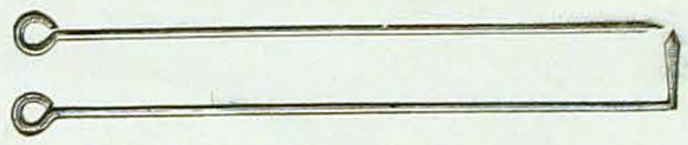


Patent Wood Handle, Fastened	per gross	$20.00
No. 2. Wood Handle, Common Size	per gross	17.00
No. 3. Wood Handle, Large size	per gross	20.00
No. 5. Short Iron Handle, Common Size	per gross	18.00
No. 7. Medium Iron Handle, Common size	per gross	21.50
No. 9. Long Iron Handle, Common size	per gross	27.00
No. 10. Long Iron Handle, Large size	per gross	30.00

Sifter Shovels, $2.50 per gross extra.

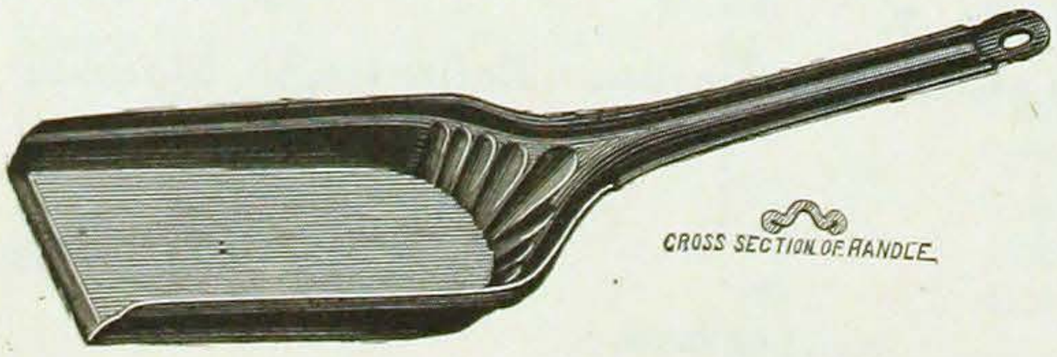
Discount.....

Pokers.



No. 1.	¼-inch iron, 16 inches, long	per doz.	$0.60
No. 2.	5/16-inch iron, 16 inches long	per doz.	.70
No. 3.	5/16-inch iron, 20 inches long	per doz.	.90
No. 4.	⅜-inch iron, 20 inches long	per doz.	1.12
No. 5.	7/16-inch iron, 22 inches long	per doz.	1.50
No. 6.	Wood Handle	per doz.	1.12
No. 7.	Wood Handle Polished	per doz.	1.35
No. 8.	Range, 7/16-inch iron, 24 inches long	per doz.	2.00
No. 9.	Range, 7/16-inch iron, 28 inches long	per doz.	2.75
No. 10.	Heater, 7/16-inch iron, 36 inches long	per doz.	3.75
No. 11.	Heater, ½-inch iron, 48 inches long	per doz.	5.00
No. 12.	Heater, ⅝-inch iron, 60 inches long	per doz.	7.00
No. 1.	Stove Scrapers, ¼-inch iron, 30 inches long	per doz.	1.25
No. 2.	Stove Scrapers, ¼-inch iron, 36 inches long	per doz.	1.50
No. 2.	Stove Lifters, Wrought Iron	per doz.	.75
Patent Wood Handle Lifters		per doz.	1.00
Patent Wood Handle Pokers		per doz.	2.00
Common Cast Iron Lifters		per doz.	.50
Bronze Cast Iron Lifters		per doz.	.60

Discount.....



Japanned "Cottage" Coal Shovels.

No.	**121**
Inches	15x4¾
Japanned, per gross.	6.00

Discount.....



Tinned Shovels.

WOOD HANDLED—EXTRA STRONG.

No.	**300**
Inches	5x7¾
Tinned, per doz.	$1.50

"Imperial" Coffee Mills.

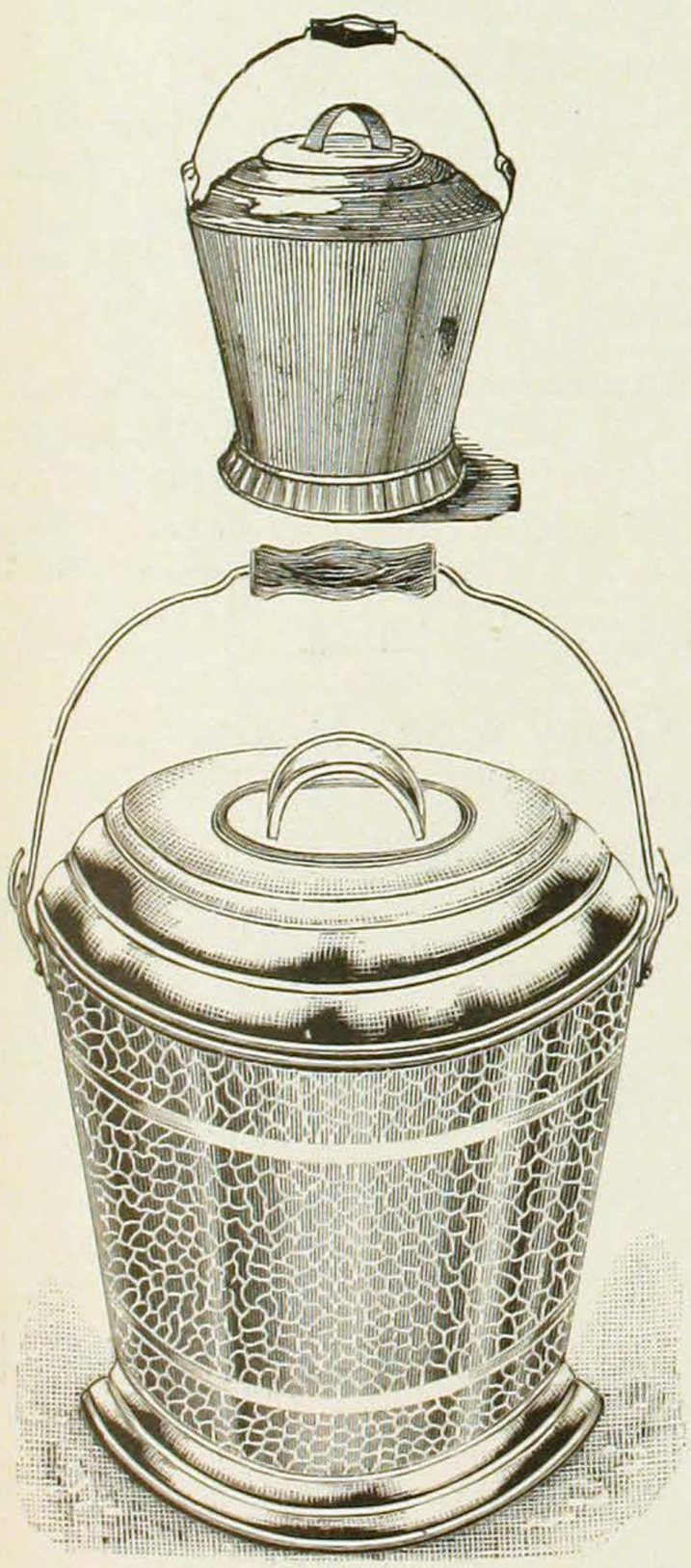
PATENTED.

Steel Grinders.—Sheet Iron Box.

No.	**65**
Per doz.	$13.50

This improved Mill has a very simple regulator at the top, which only requires a few turns to right or left to produce the required fineness, and a canister which locks in position to receive the ground coffee.

Discount.....



Galvanized Chamber Pails.

Plain Galvanized.

No. 1.	Small	per doz.	$7.75
No. 2.	Medium	per doz.	9.50
No. 3.	Large	per doz.	11.00

Discount.....

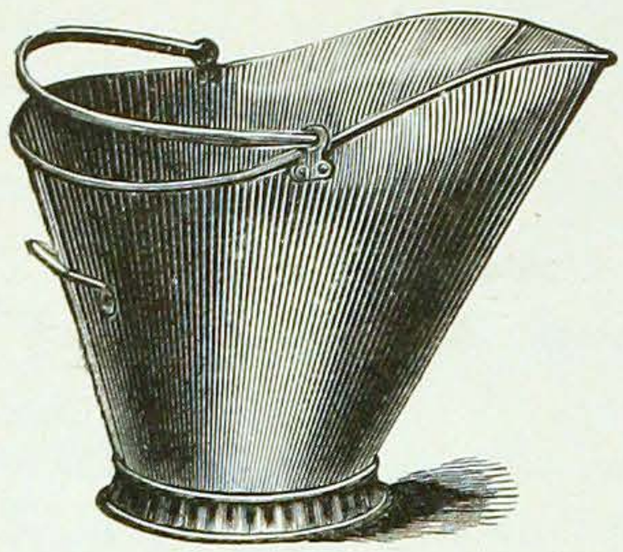
Galvanized and Striped.

No. 1.	Small	per doz.	$8.75
No. 2.	Medium	per doz.	10.50
No. 3.	Large	per doz.	12.00

Discount.....

Acme Chamber Buckets.

Small	per doz.	$5.50
Medium	per doz.	6.50
Large	per doz.	7.50



Patent Pressed Corrugated Bottom Coal Hods.

SQUARE MOUTH.

Galvanized.

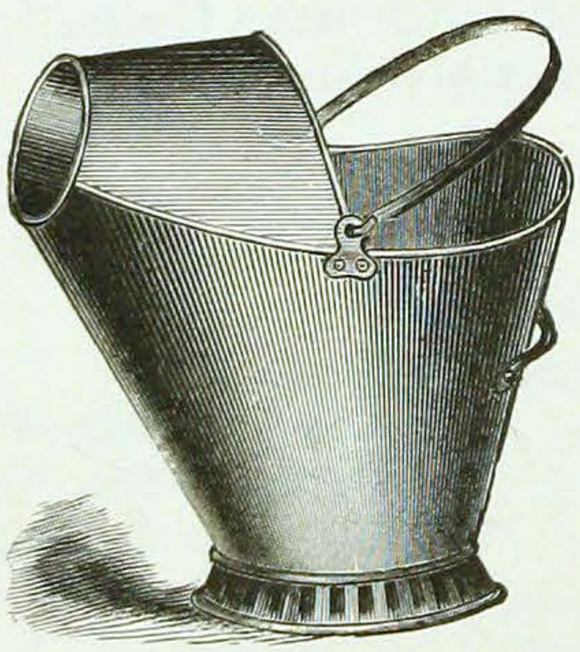
No. 4.	14 inches	. . . .	per dozen $7.00
No. 5.	15 inches	. . . .	per dozen 7.50
No. 6.	16 inches	. . . .	per dozen 8.00
No. 7.	17 inches	. . . .	per dozen 8.50
No. 8.	18 inches	. . . .	per dozen 10.00
No. 9.	19 inches	. . . .	per dozen 12.50

Discount.....

Japanned.

No. 14.	14 inches	. . .	per dozen $5.00
No. 15.	15 inches	. . .	per dozen 5.50
No. 16.	16 inches	. . .	per dozen 6.00
No. 17.	17 inches	. . .	per dozen 6.50
No. 18.	18 inches	. . .	per dozen 7.00
No. 19.	19 inches	. . .	per dozen 8.50

Discount.....



Morning Glory Coal Hods.

OLD STYLE.

Galvanized.

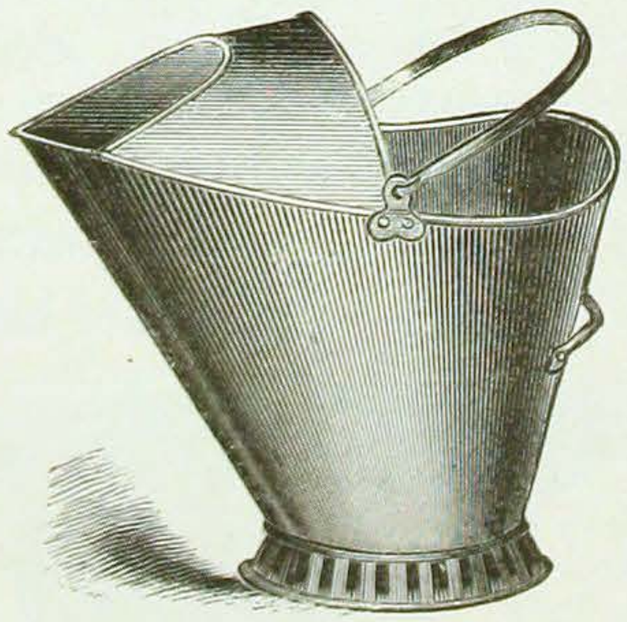
No. 25.	15 inches	. . .	per dozen $10.00
No. 26.	16 inches	. . .	per dozen 11.00
No. 27.	17 inches	. . .	per dozen 12.00
No. 28.	18 inches	. . .	per dozen 13.50

Discount.....

Japanned.

No. 35.	15 inches	. . .	per dozen $7.00
No. 36.	16 inches	. . .	per dozen 7.50
No. 37.	17 inches	. . .	per dozen 8.00
No. 38.	18 inches	. . .	per dozen 9.00

Discount.....



Morning Glory Coal Hods.

NEW STYLE.

Galvanized.

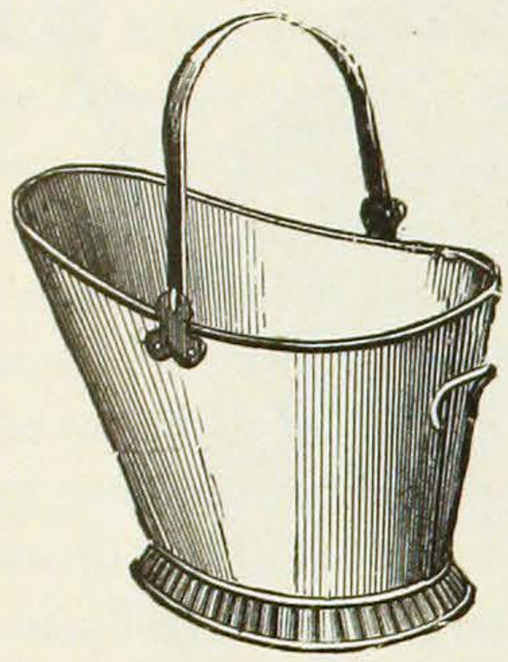
No. 45.	15 inches	. . . .	per doz. $10.00
No. 46.	16 inches	. . . .	per doz. 11.00
No. 47.	17 inches	. . . .	per doz. 12.00
No. 48.	18 inches	. . . .	per doz. 13.50

Discount.....

Japanned.

No. 55.	15 inches	. . . .	per doz. $7.00
No. 56.	16 inches	. . . .	per doz. 7.50
No. 57.	17 inches	. . . .	per doz. 8.00
No. 58.	18 inches	. . . .	per doz. 9.00

Discount.....



Oval Mouth Coal Hods.

Galvanized.

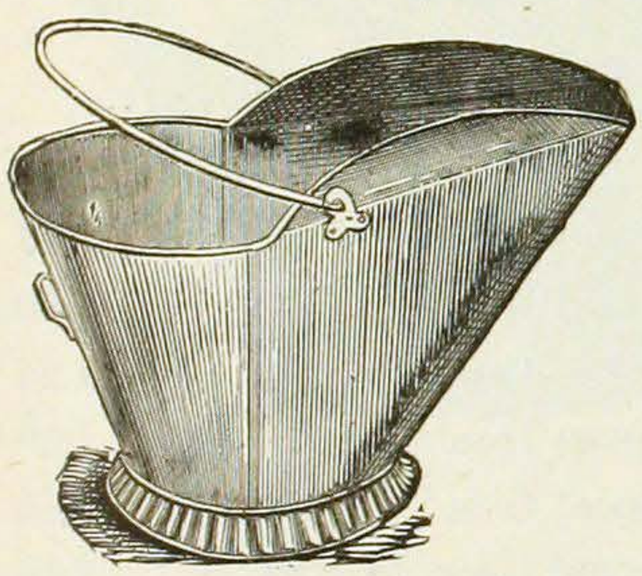
No. 64.	14 inches	per doz.	$7.00
No. 65.	15 inches	per doz.	7.50
No. 66.	16 inches	per doz.	8.00
No. 67.	17 inches	per doz.	8.50
No. 68.	18 inches	per doz.	10.00
No. 69.	19 inches	per doz.	12.50

Discount.....

Japanned.

No. 74.	14 inches	per doz.	$5.00
No. 75.	15 inches	per doz.	5.50
No. 76.	16 inches	per doz.	6.00
No. 77.	17 inches	per doz.	6.50
No. 78.	18 inches	per doz.	7.00
No. 79.	19 inches	per doz.	8.50

Discount.....



Perfection Coal Hods.

No Spilling of Coal.

Galvanized.

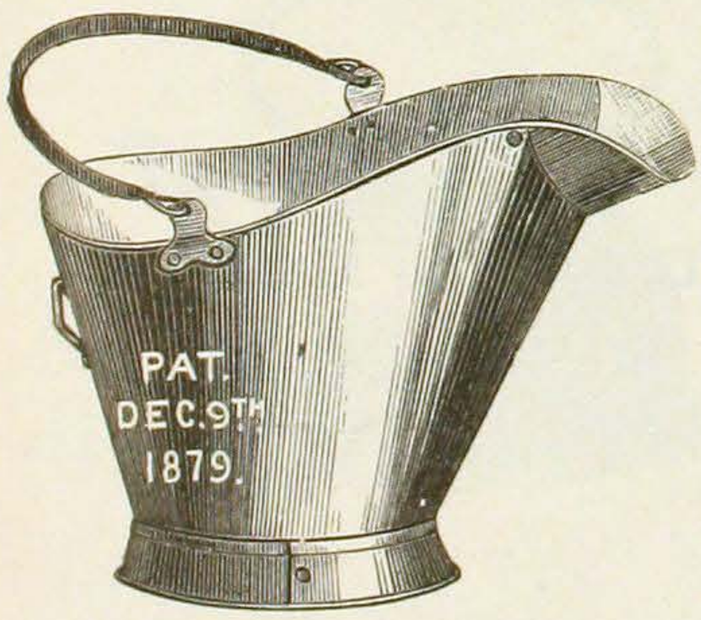
No. 85.	15 inches	per doz.	$10.00
No. 86.	16 inches	per doz.	11.00
No. 87.	17 inches	per doz.	12.00
No. 88.	18 inches	per doz.	13.50

Discount.....

Japanned.

No. 95.	15 inches	per doz.	$7.00
No. 96.	16 inches	per doz.	7.50
No. 97.	17 inches	per doz.	8.00
No. 98.	18 inches	per doz.	9.00

Discount.....



New O. K. Hod.

Corrugated and Double Seamed Bottom.

Galvanized.

No. 25.	15 inches . . .	per doz.	$ 9.00
No. 26.	16 inches . . .	per doz.	10.00
No. 27.	17 inches . . .	per doz.	11.00
No. 28.	18 inches . . .	per doz.	12.50

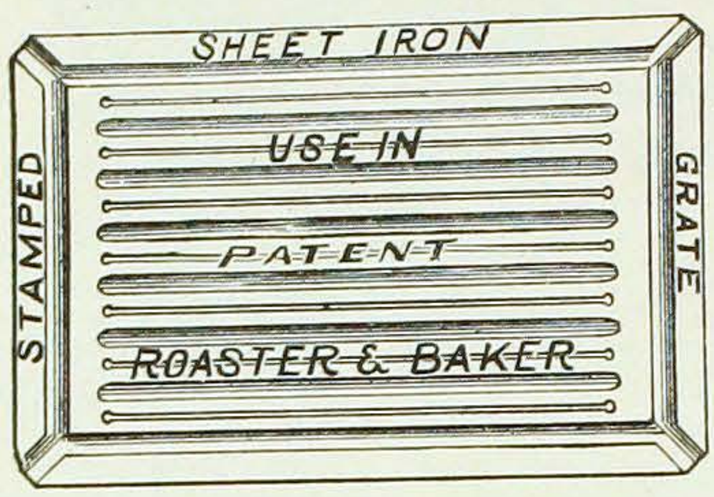
Discount.....

Japanned.

No. 35.	15 inches . . .	per doz.	$6.50
No. 36.	16 inches . . .	per doz.	7.00
No. 37.	17 inches . . .	per doz.	7.50
No. 38.	18 inches . . .	per doz.	8.50

Discount.....

Roaster and Baker.



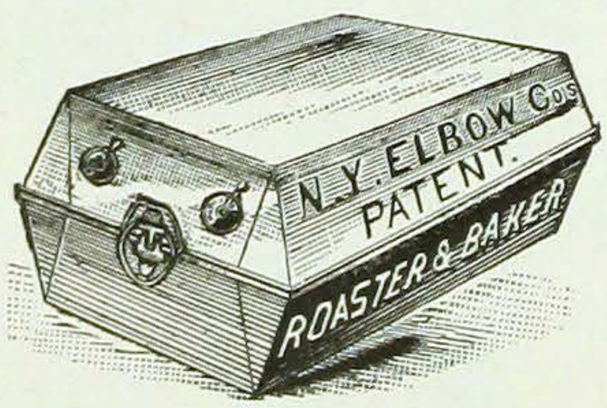
These Bakers are constructed strictly on scientific principles, have been thoroughly tested by the best chemists and practical men and women of the country, and pronounced by them one of the most important discoveries of the nineteenth century.

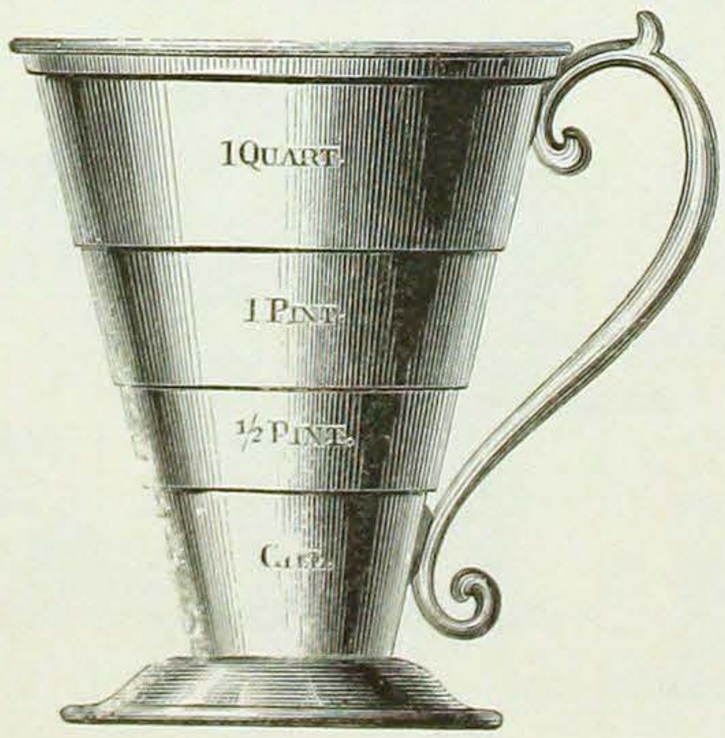
Any article of food cooked in these Bakers will retain its sweetness, flavor, nourishment, etc., better than any other means of cooking. This Baker will pay for itself many times a year by increasing the amount of nutriment in each loaf baked in it at least ten per cent., while a much larger percentage is saved in roasting meats, for which it is particularly adapted. In cooking in these Bakers less heat is required, as the steam generated is not allowed to escape as from an open pan, thus retaining the heat as well as the nutritious gases—hence, saving of fuel.

PRICE-LIST, INCLUDING SHEET-IRON GRATE.

No.	Size.		Inches deep.	Each.
1	$6\frac{3}{4}$x10	Charcoal Iron	$5\frac{1}{2}$	$ .75
2	$7\frac{3}{4}$x$11\frac{1}{2}$	Charcoal Iron	6	1.00
3	$8\frac{3}{4}$x13	Charcoal Iron	$6\frac{1}{2}$	1.25
4	$9\frac{3}{4}$x$14\frac{1}{2}$	Charcoal Iron	7	1.50
5	$10\frac{3}{4}$x$16\frac{1}{4}$	Charcoal Iron	$7\frac{1}{2}$	1.80
6	$11\frac{3}{4}$x$17\frac{3}{4}$	Charcoal Iron	$8\frac{1}{2}$	2.10
7	$14\frac{1}{4}$x$20\frac{1}{4}$	Charcoal Iron	9	2.50

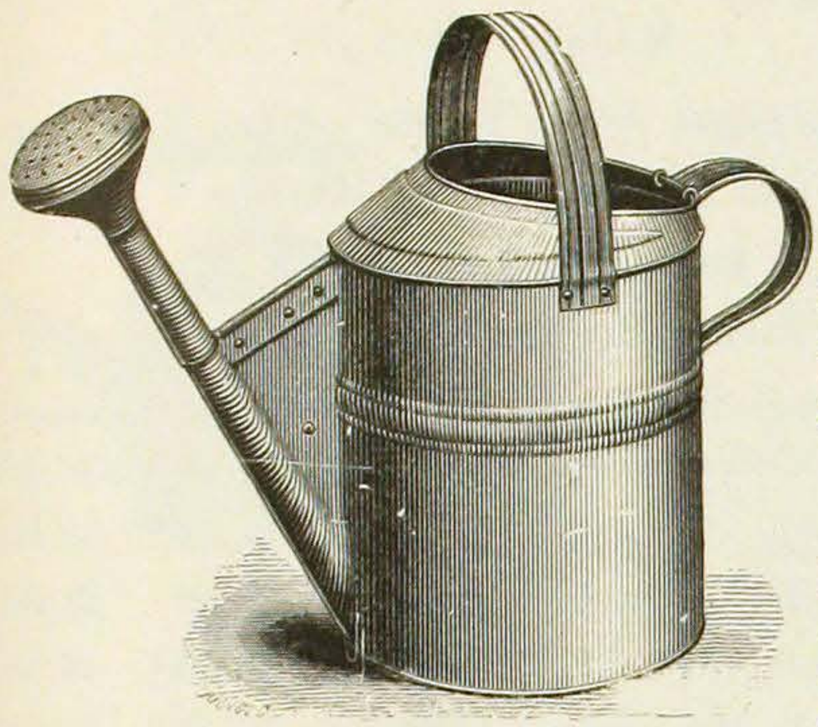
Discount.....





Coovers, Graduated Measures.

Per doz. 3.75



"Iron Clad" Water Pots.

PATENTED JANUARY 4, 1881.

Galvanized.

6 quart	per doz.	$12.00
8 quart	per doz.	15.00
10 quart	per doz.	18.00
12 quart	per doz.	21.00
16 quart	per doz.	24.00
20 quart	per doz.	42.00

Discount.....per cent.

This cut represents the Iron Clad Galvanized Iron Water Pot, to which we call your special attention, the body and spout being stamped out of one piece of sheet iron. For strength and durability it cannot be surpassed.



Copper Kettles—Royal.

Spun Bottom, Seamless Edge, with New Patent Spout, and Ebonized Wood Handle.

Planished Copper.

5 SIZES—PIT OR FLAT BOTTOM.

No.	Qts.	Pit.	Body.			Nickeled.
5.	2½		6 inch	per doz.	$21.00	$30.00
6.	4	6 inch,	7 inch	per doz.	24.00	33.00
7.	6	7 inch,	8⅜ inch	per doz.	27.00	36.00
8.	7½	8 inch,	9⅜ inch	per doz.	30.00	39.00
9.	9½	9 inch,	10⅜ inch	per doz.	33.00	42.00

Flat Bottom same price as Pit.

Discount.....



Copper Kettles—Range or Parlor Stove Kettle.

Planished. Spun Kettle—Flat Bottom, Ebonized Wood Handle.

No.	Qts.	Body.			Nickeled.
0.	1	5½ inch	per doz.	$13.50	$20.50
1.	1½	6½ inch	per doz.	15.00	22.50
2.	2	7½ inch	per doz.	16.50	24.00
3.	2½	8½ inch	per doz.	20.00	27.00
4.	3½	9½ inch	per doz.	23.00	30.00
5.	5½	10½ inch	per doz.	27.00	36.00

Brass Range Kettle.

No.	Qts.	Body.		
0.	1	5½ inch	per doz.	$18.00
1.	1½	6½ inch	per doz.	21.00
2.	2	7½ inch	per doz.	24.00
3.	2½	8½ inch	per poz.	27.00
4.	3½	9½ inch	per doz.	30.00
5.	5½	10½ inch	per doz.	33.00

Discount.....



Copper Kettles—Imperial.

EXTRA HEAVY.

Seamless Edge. Spun Kettle. With New Patent Spout, and Ebonized Wood Handle.

Planished Copper.

5 SIZES—PIT OR FLAT BOTTOM.

No.	Qts.	Pit.	Body.		Nickeled.
5.	2½		6 inch .	per doz. $27.00	$36.00
6.	4	6 inch,	7 inch .	per doz. 30.00	39.00
7.	6	7 inch,	8⅜ inch .	per doz. 33.00	42.00
8.	7½	8 inch,	9⅜ inch .	per doz. 36.00	45.00
9.	9½	9 inch,	10⅜ inch .	per doz. 39.00	48.00

Flat Bottom same price as Pit.

Discount.....

These kettles are spun from the bottom in one piece up to the breast, making a body of great strength and durability.



Tin Tea Kettles.

PLANISHED.

Flat Bottom. Made especially for Oil Stoves Spun Copper Bottom. Seamless Edge. And also adapted for Base Burners.

Extra Heavy, IXXX Tin.

No. 5.	2½ qts. 6 inch Body . .	per doz.	$8.00
No. 5½.	4 qts. 7 inch Body . .	per doz.	9.00

Discount.....



Tin Tea Kettles.

PLANISHED.

Seamless Edge. Spun Copper Bottom.

Extra Heavy, IXXX Tin.

4 SIZES. PIT OR FLAT BOTTOM.

		PIT	BODY		
No. 6.	4 qts.	6 in.	7 in.	per doz.	$10.00
No. 7.	6 qts.	7 in.	8⅜ in.	per doz.	11.00
No. 8.	7½ qts.	8 in.	9⅜ in.	per doz.	13.00
No. 9.	9½ qts.	9 in.	10⅜ in.	per doz.	14.00

Flat Bottom same price as pit.

Discount.....



Brass and Copper "Hammered" Tea Kettles.

A beautiful ornament for parlor stoves. Seamless Spun Edge. Ebonized Wood Handle.

6 Sizes—Pit or Flat Bottom.

NO.	QTS.	PIT	BODY			NICKELED
4.	1½		5 inches	. .	per doz. $18.00	$27.00
5.	2½		6 inches	. .	per doz. 21.00	30.00
6.	4	6 inches,	7 inches	. .	per doz. 24.00	33.00
7.	6	7 inches,	8⅜ inches	. .	per doz. 27.00	36.00
8.	7½	8 inches,	9⅜ inches	. .	per doz. 30.00	39.00
9.	9½	9 inches,	10⅜ inches	. .	per doz. 33.00	42.00

Flat Bottom same price as Pit.

Discount.....



Hammered Tin Tea or Coffee Pots.

Copper Bottom.

Extra Heavy.

No. 2.	2 Pints . . .	per doz.	$8.00
No. 3.	3 Pints . . .	per doz.	9.00
No. 4.	4 Pints . . .	per doz.	10.00

Discount.....



Tea and Coffee Pots.

Silver Lined. Square.

Brass or Copper.

No. 1.	2 pints	per doz.	$21.00
No. 2.	3 pints	per doz.	24.00
No. 3.	4 pints	per doz.	27.00

Nickeled.

No. 1.	2 pints	per doz.	$27.00
No. 2.	3 pints	per doz.	30.00
No. 3.	4 pints	per doz.	33.00

Discount.....

Round.

Brass or Copper.

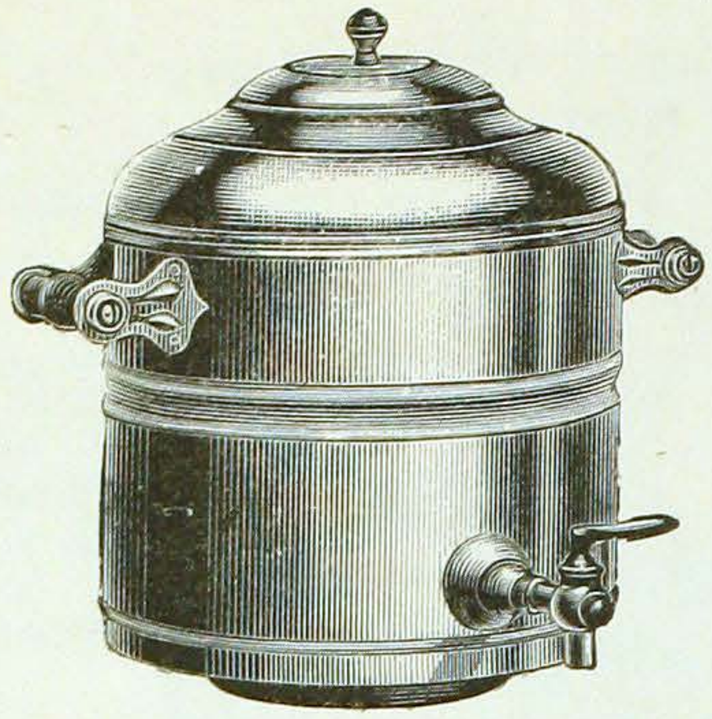
No. 4.	2 pints	per doz.	$15.00
No. 5.	3 pints	per doz.	18.00
No. 6.	4 pints	per doz.	21.00

Nickeled.

No. 4.	2 pints	per doz.	$21.00
No. 5.	3 pints	per doz.	24.00
No. 6.	4 pints	per doz.	27.00

Discount.....



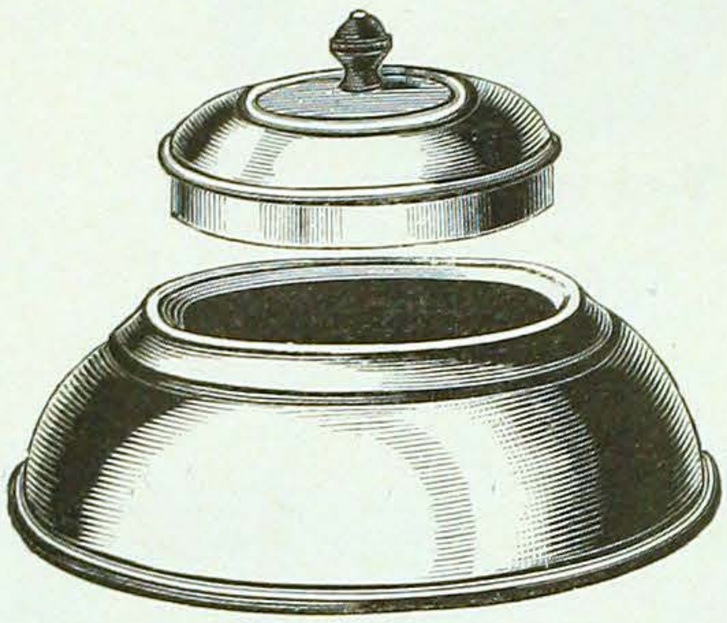


Copper Urns.

With Flat or 6 in. Pit Bottom. Spun Bottom. Seamless Edge. Rosewood Handles, on Sides or Front and Back.

		Nickeled.
8 inch Body, 2 gall. . .	$5.75	$7.00
9 inch Body, 3 gall. . .	6.50	8.00
10 inch Body, 4 gall. . .	7.50	9.00

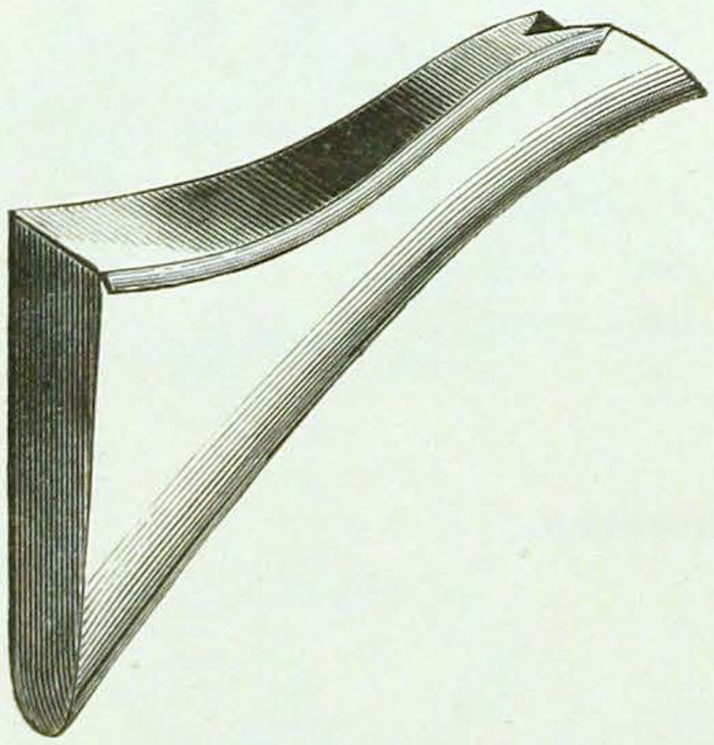
Discount.....



Copper Breasts and Covers.

No. 5.	6 inches diameter . .	per doz. $6.00
No. 6.	7 inches diameter . .	per doz. 6.50
No. 7.	8 inches diameter . .	per doz. 7.00
No. 8.	9 inches diameter . .	per doz. 8.00
No. 9.	10 inches diameter . .	per doz. 9.00

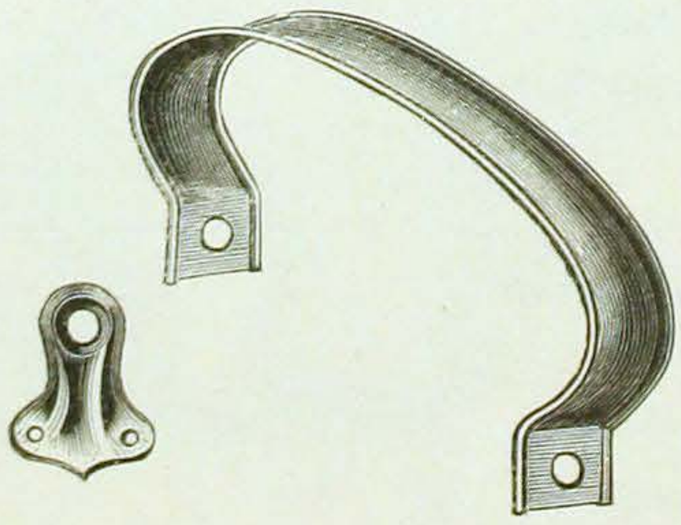
Discount.....



Copper Spouts.

5, 6, 7, 8 and 9 inches . . . per doz. $3.00

Discount.....

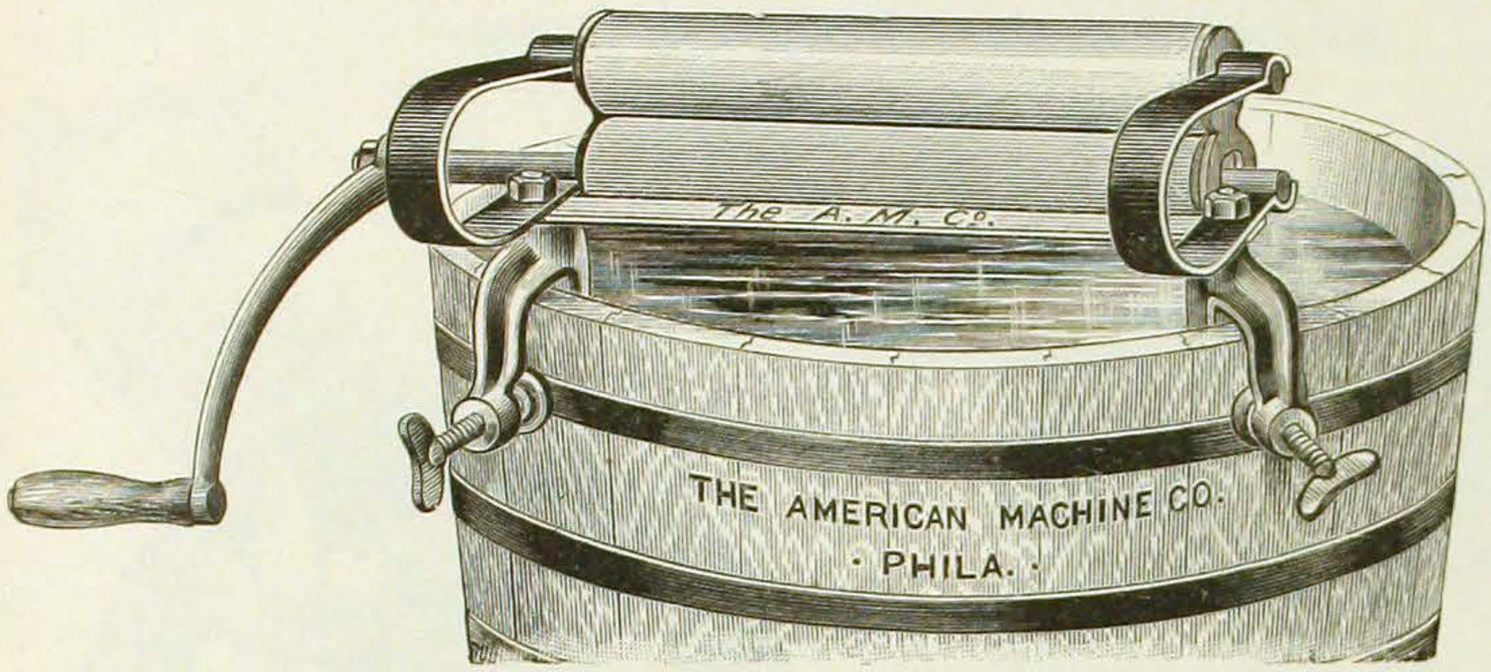


Copper Handles and Ears.

No. 5	per doz. $2.50
No. 6	per doz. 2.50
No. 7	per doz. 3.00
No. 8	per doz. 3.00
No. 9	per doz. 3.00

Discount.....

The A. M. Co. Wringer.



This Wringer is in every respect the most practical one made. When fastened tightly on the Tub, as shown in cut, it is ready for use. The horseshoe-shaped steel springs supply automatically the necessary pressure to wring clothes of varying thickness, the clothes only needing spreading out as they pass between the Rolls to ensure being wrung dry with little exertion.

The Rolls are of white Rubber, and warranted equal to the best made.

No. 2. Rolls 10 inches long, $1\frac{3}{4}$ inches diameter . . . . . per doz. $36.00
No. $2\frac{1}{2}$. Rolls 12 inches long, $1\frac{3}{4}$ inches diameter . . . . . per doz. 48.00

Discount.....

The "Diamond" Oil Can.

We desire to call the attention of the trade to the "DIAMOND" Glass Oil Can.

It consists of a glass body, encased in a strong tin jacket embossed in such a manner as to protect the glass and add beauty to the can.

A slot in the back of the jacket, exposing the glass on which a gauge is stamped, enables one to see, at any time, the exact measure of oil in the can.

A SOLID RAISED TIN BOTTOM perfectly protects the glass bottom, and being raised, forms a rim for can to rest on, which protects the tin bottom from being worn and rusted by coming in contact with other substances.

It has a DEPRESSED TOP by which all overflow of oil is carried back into the can in place of allowing it to run down on the outside.

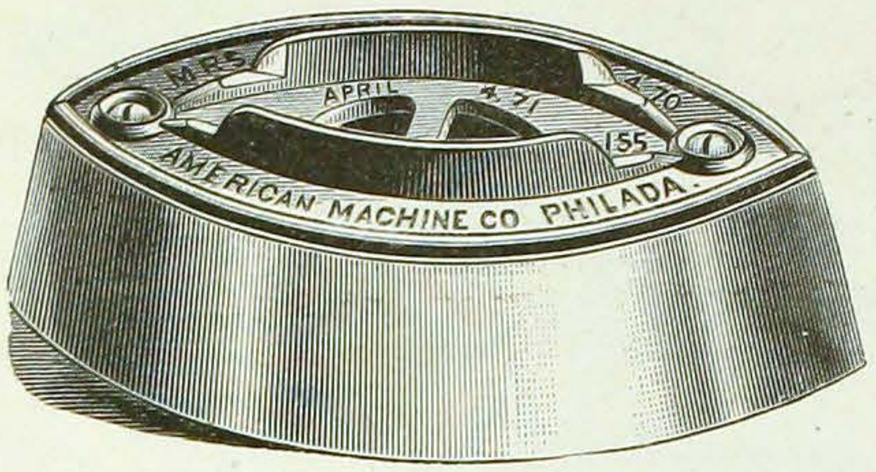
The top is doubly secured by both screw and cement.

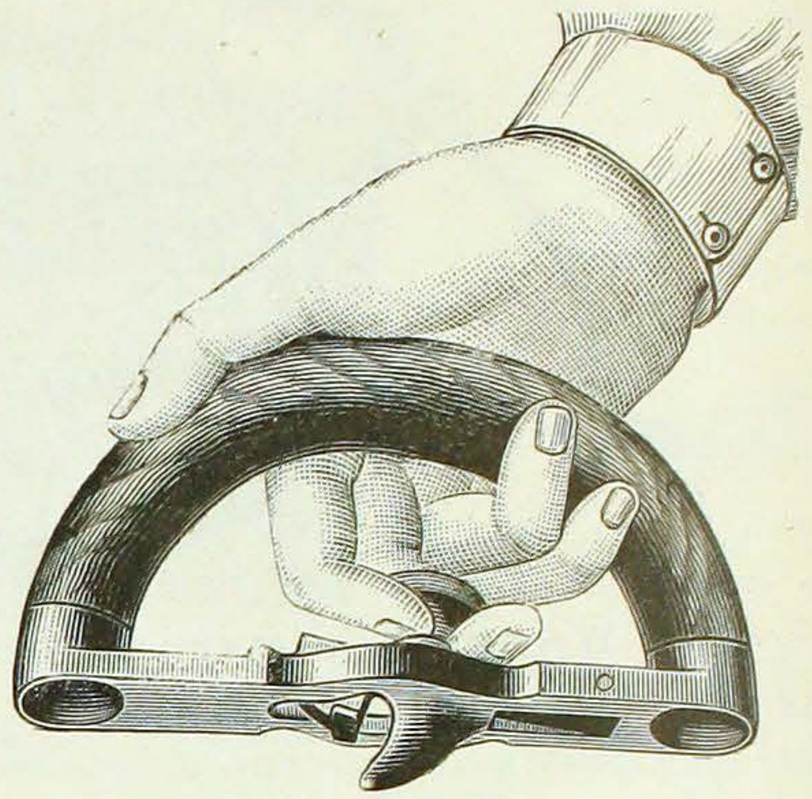
1 gallon . . per doz.
$\frac{1}{2}$ gallon . . per doz.

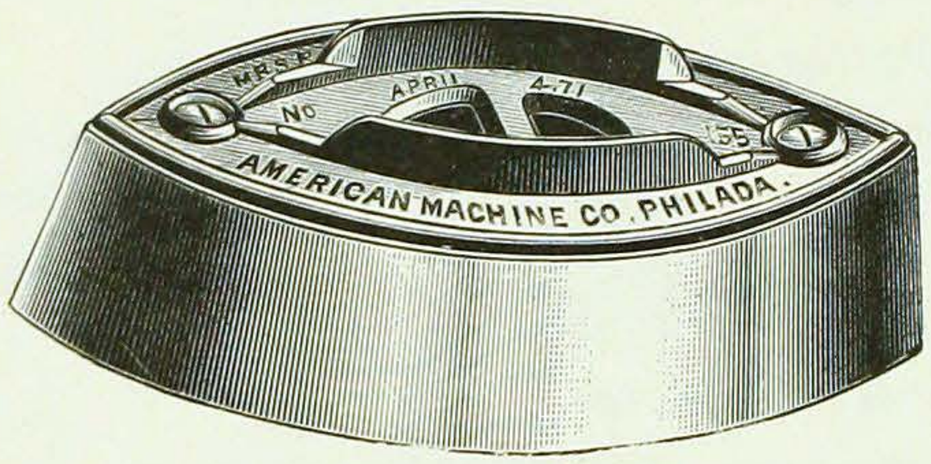
Packed in cases containing one doz. Every can tested and warranted tight.

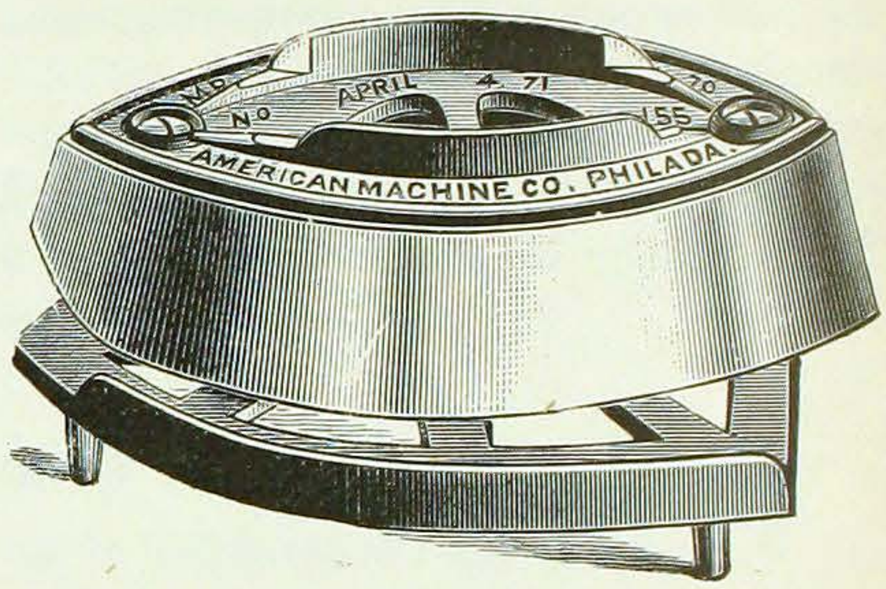


Mrs. Potts' Patent "Crown" Cold Handle Double Pointed, Smoothing and Polishing Irons.









The great merits of these Irons are already so universally known that it seems needless to refer to them here, a few main points, however, may not be amiss.

They are better made and finer finished, and hold the heat longer than any iron heretofore produced.

They are double pointed, and will iron either way.

The handle being of walnut wood, detachable by a spring, never becomes hot. requires therefore no holder or cloth, and being of a circular shape fits the hand naturally without straining the wrist or arm.

Three irons, one handle, and stand constitutes a set, as represented by above cuts There are three sizes in each set. No. 1 weighs about four pounds, has one round end for polishing or glossing, and is very suitable for light work; No. 2 weighs about five pounds, and is for general use; No. 3 weighs about six pounds, and is suitable for table-cloths, sheets, etc.

No. 150.	Nickel-plated	per doz. sets	$30.00
No. 155.	Plain Polished	per doz. sets	24.00

Packed half dozen sets in a case.

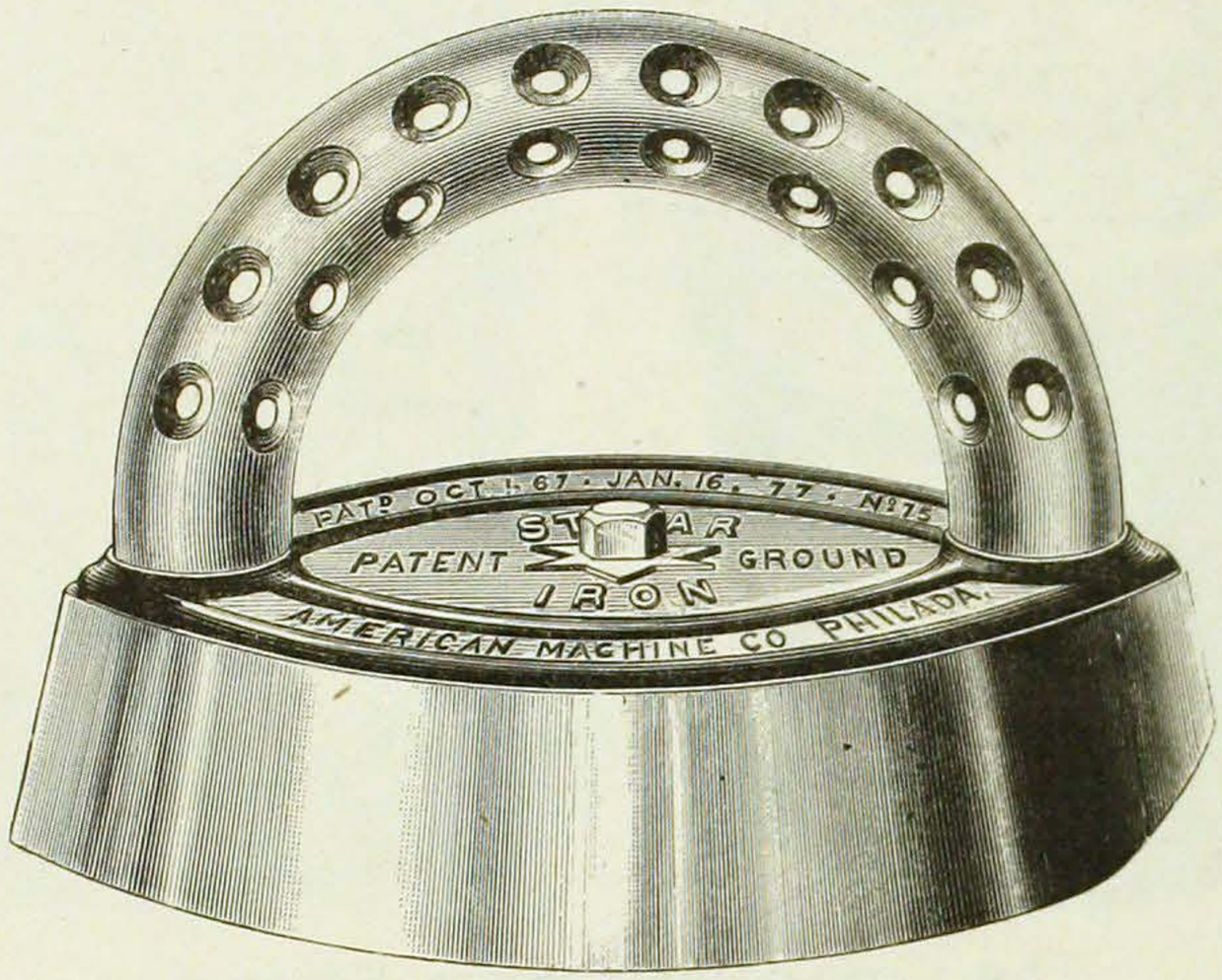
No. 150.	Nickel-plated, Nos. 1, 2, or 3, with Handles .	per doz. Irons	$12.00
No. 150.	Nickel-plated, Nos. 1, 2, or 3, without Handles .	per doz. Irons	9.00
No. 155.	Plain Polished, Nos. 1, 2, or 3, with Handles .	per doz. Irons	10.00
No. 155.	Plain Polished, Nos. 1, 2, or 3, without Handles	per doz. Irons	7.00
Extra Handles		per doz.	4.00
Improved Sad-Iron Stands		per doz.	.75

Packed one dozen in a case.

Discount.....

Star Double Pointed Smoothing and Polishing Irons.

MRS. POTTS' PATENT.



This is the same as our Nos. 150 and 155 Irons, but without the detachable wooden handle, a perforated fixed iron handle being substituted instead. Although this iron does not possess the many advantages of the detachable wooden handle, it is decidedly superior in every way to the ordinary solid irons, as it has all the other features of the Nos. 150 and 155.

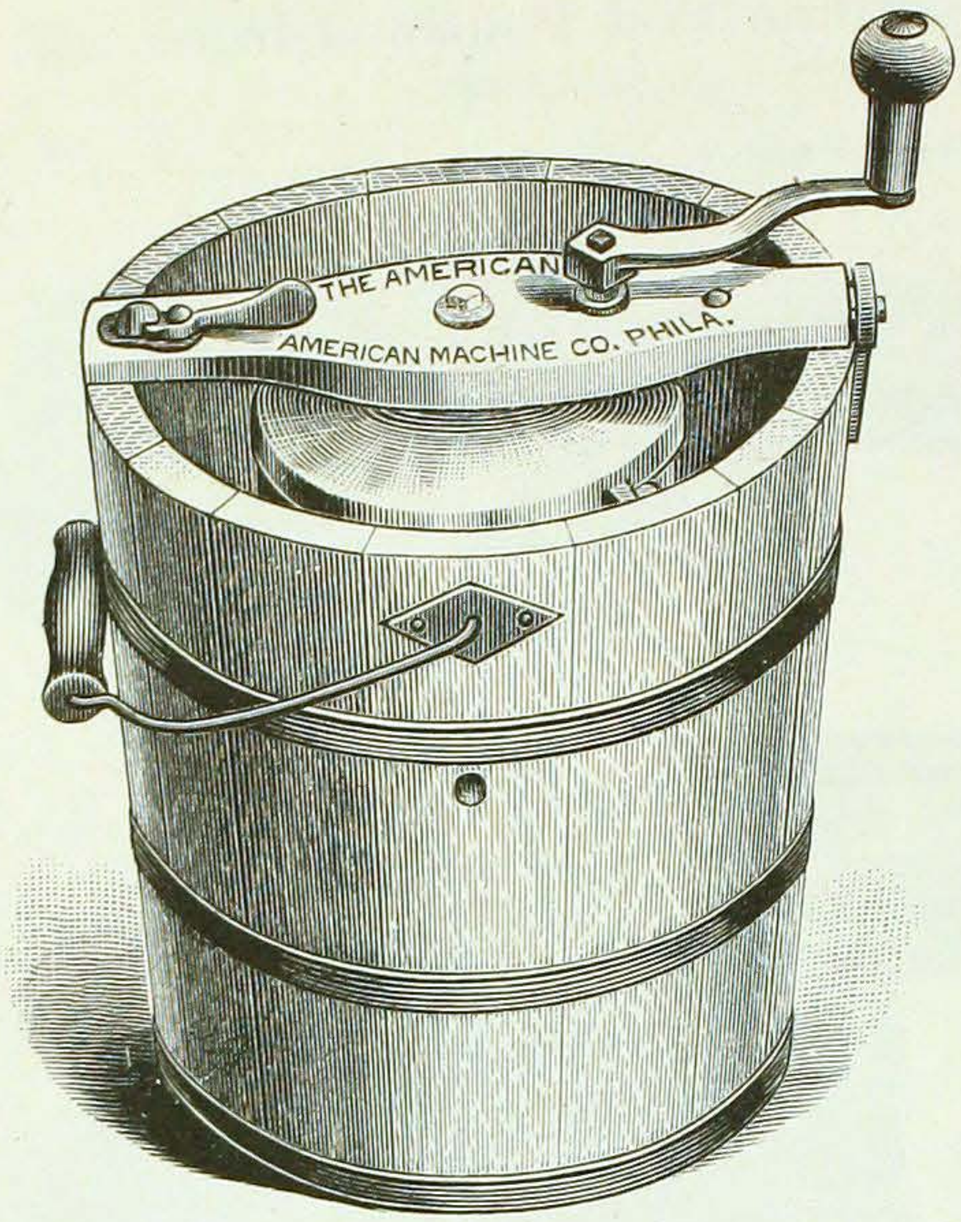
There are three sizes of these Irons. No. 1 weighs about four pounds, has one round end for polishing or glossing, and is very suitable for light work; No. 2 weighs about five pounds, and is for general use; No. 3 weighs about six pounds, and is suitable for table-cloths, sheets, etc.

No. 70. Nickel-plated, Nos. 1, 2, or 3 . . . . . per doz. $7.25

No. 75. Plain Polished, Nos. 1, 2, or 3 . . . . . per doz. 5.50

Packed one or two dozen in a case.

Discount.....



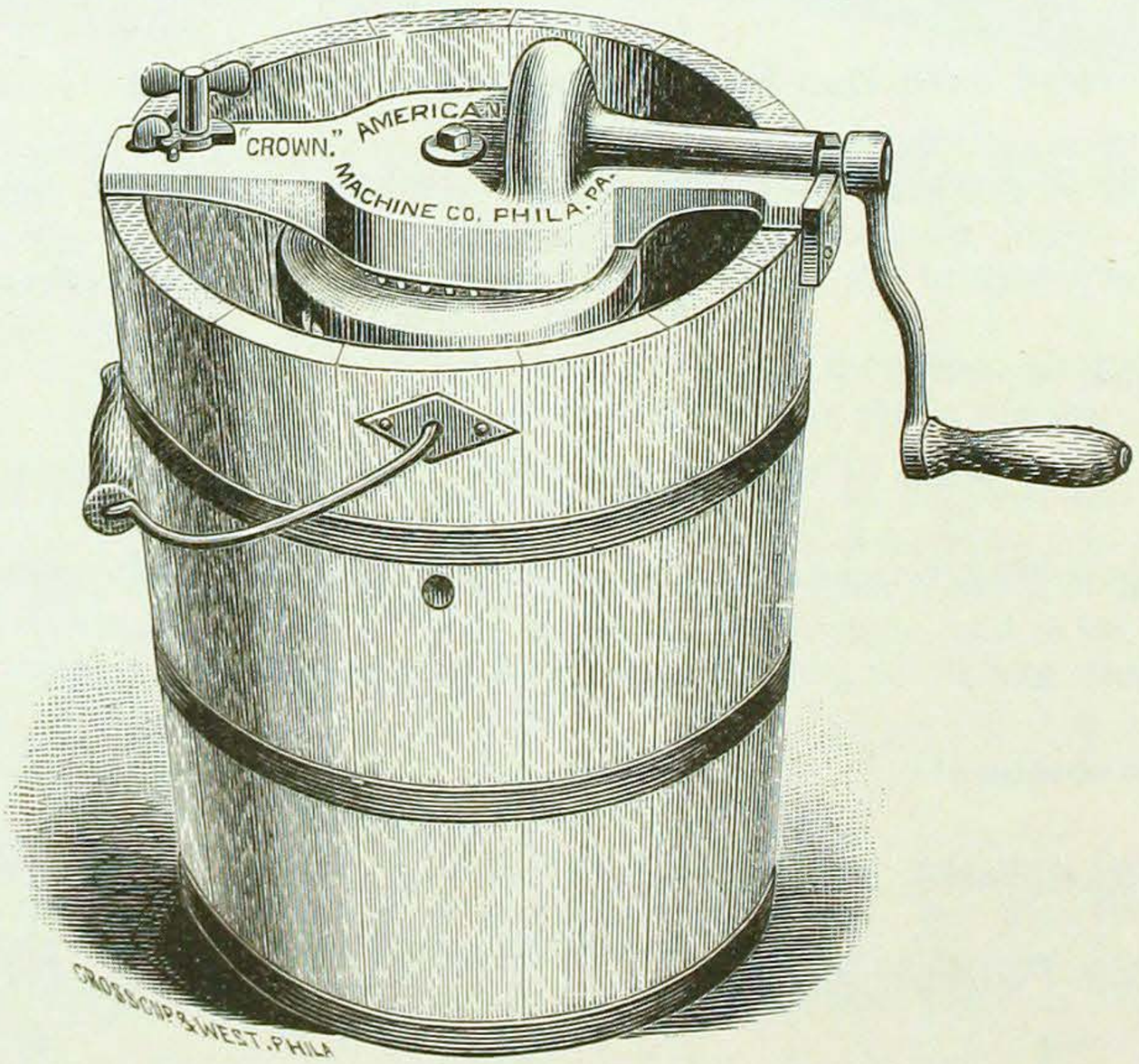
The American Ice Cream Freezer.

Sizes	**2-qt.**	**3-qt.**	**4-qt.**	**6-qt.**
Prices .	$2.75	$3.25	$3.75	$5.00

Discount.....

The Crown Ice Cream Freezer.

SINGLE ACTION.

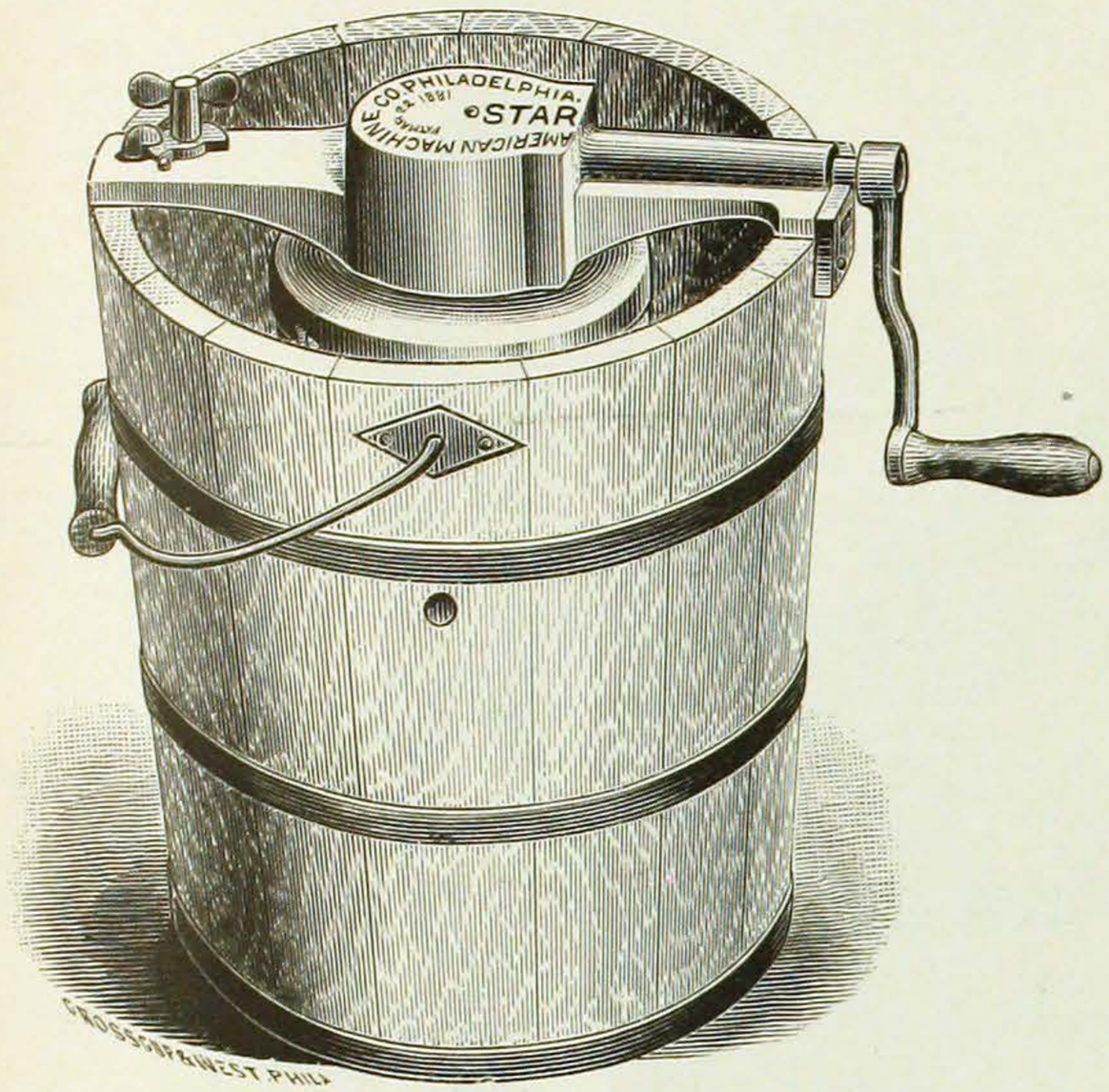


Sizes	**2-qt.**	**3-qt.**	**4-qt.**	**6-qt.**	**8-qt.**	**10-qt.**	**14-qt.**
Prices	$3.75	$4.50	$5.50	$7.00	$9.00	$11.00	$14.00

Discount.....

The Star Ice Cream Freezer.

DOUBLE ACTION.



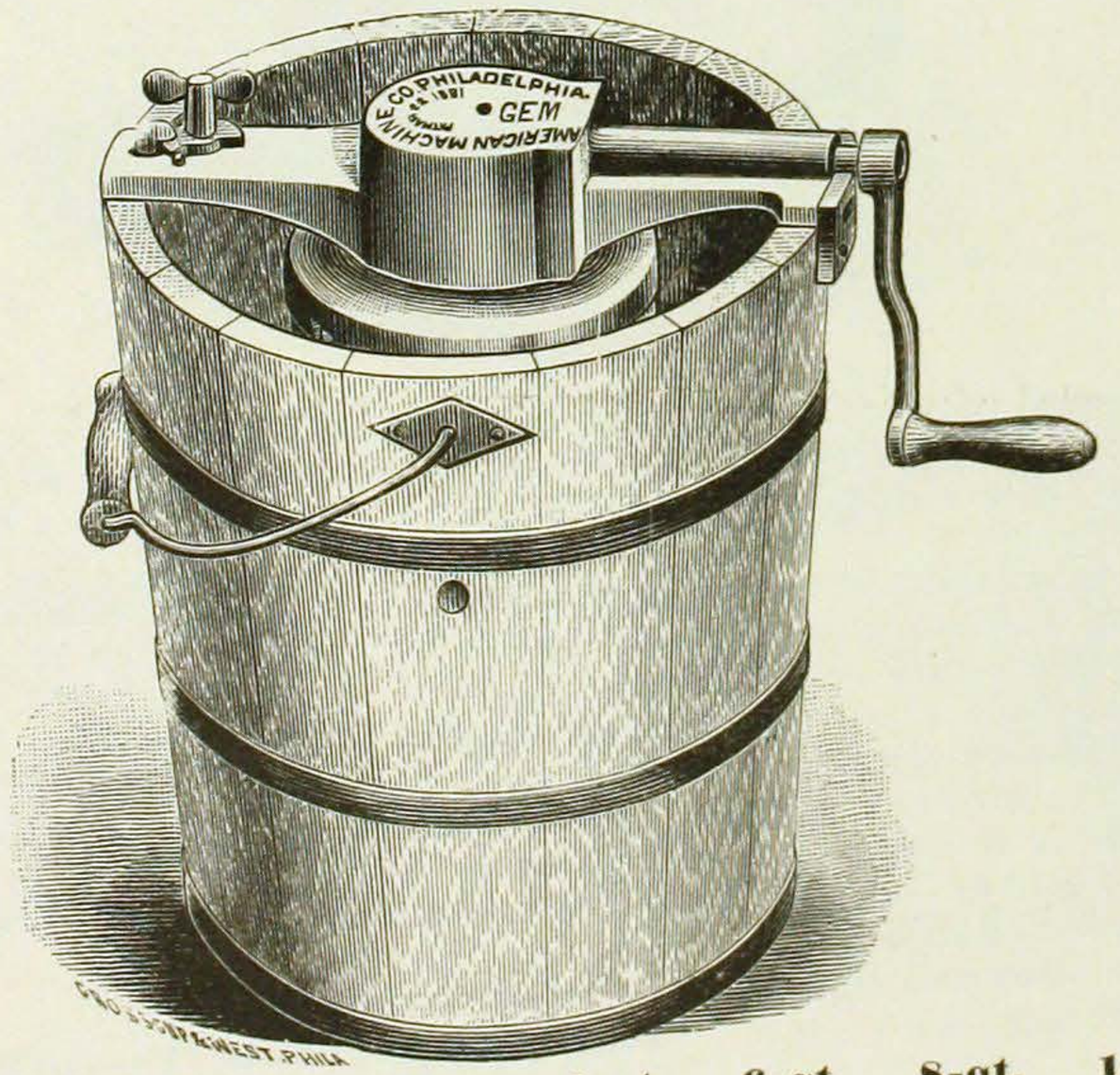
Sizes	**2-qt.**	**3-qt.**	**4-qt.**	**6-qt.**
Prices	$3.75	$4.50	$5.50	$7.00

Sizes	**8-qt.**	**10-qt.**	**14-qt.**
Prices	$9.00	$11.00	$14.00

Discount.....

The Gem Ice Cream Freezer.

DOUBLE ACTION.

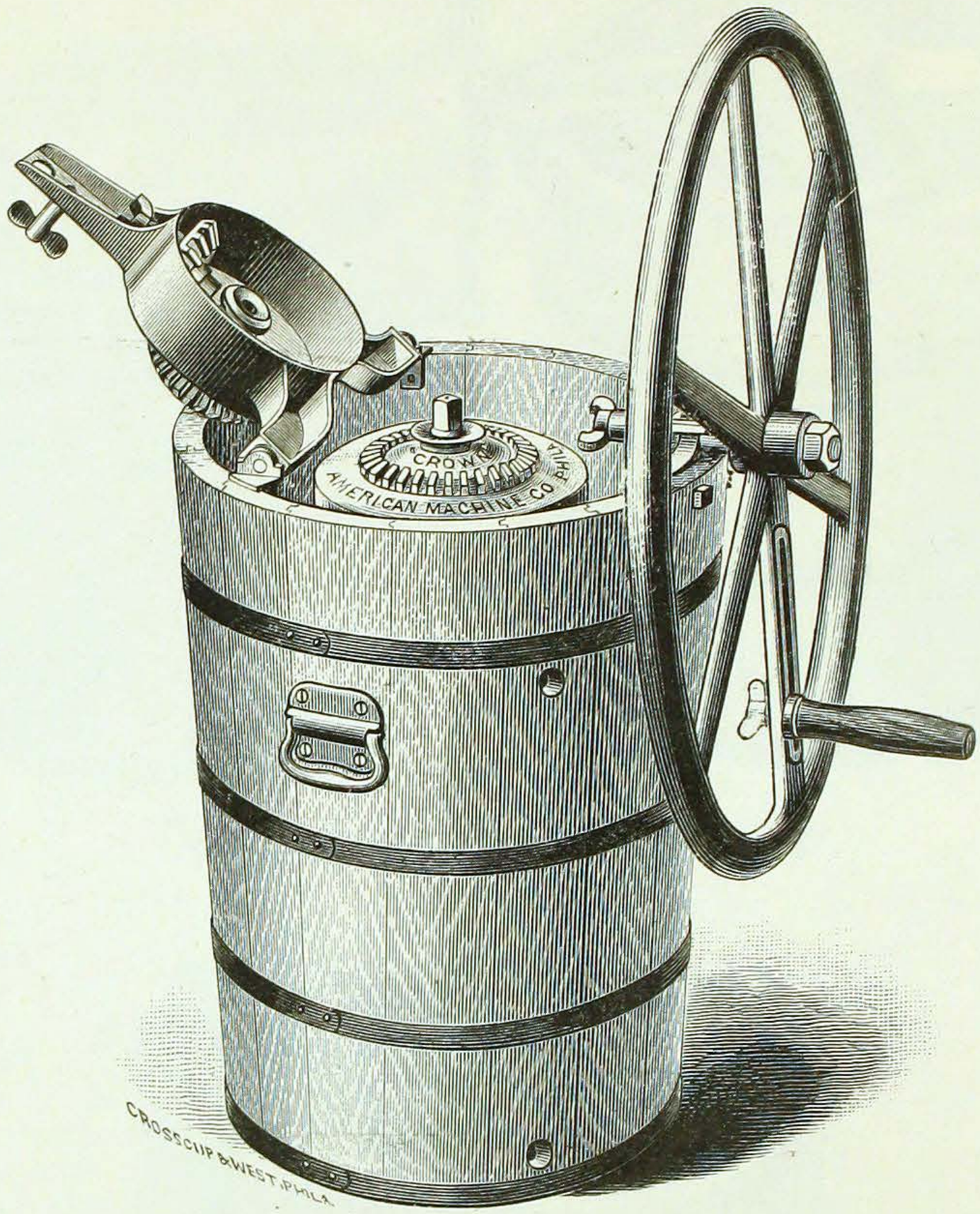


Sizes	**2-qt.**	**3-qt.**	**4-qt.**	**6-qt.**	**8-qt.**	**10-qt.**	**14-qt.**
Prices	$3.75	$4.50	$5.50	$7.00	$9.00	$11.00	$14.00

Discount.....

The Crown Ice Cream Freezer,

DOUBLE ACTION.



Is recommended with confidence as equal to the best Freezers in the market, with some meritorious advantages not found in others. Prominent among which we mention:

The Tub is made strong and of best quality Cedar, bound with Galvanized Iron Hoops.

The Cross-bar is arranged to swing up on one side of Tub to remove Can, while the fly-wheel remains stationary on opposite side of Tub, and does not require to be lifted with Bar, as in other makes of Freezers.

The Gear Shaft and Fly-wheel Shaft are connected by means of a Clutch, which engages and disengages by simply raising or lowering the Cross-bar.

The Can can be revolved to harden Cream after Stirrer has been removed.

The Cross-bar is arranged to give the greatest facility for packing Ice.

The Can and Stirrer both revolve, but in opposite directions.

The Scraper is Self-adjusting.

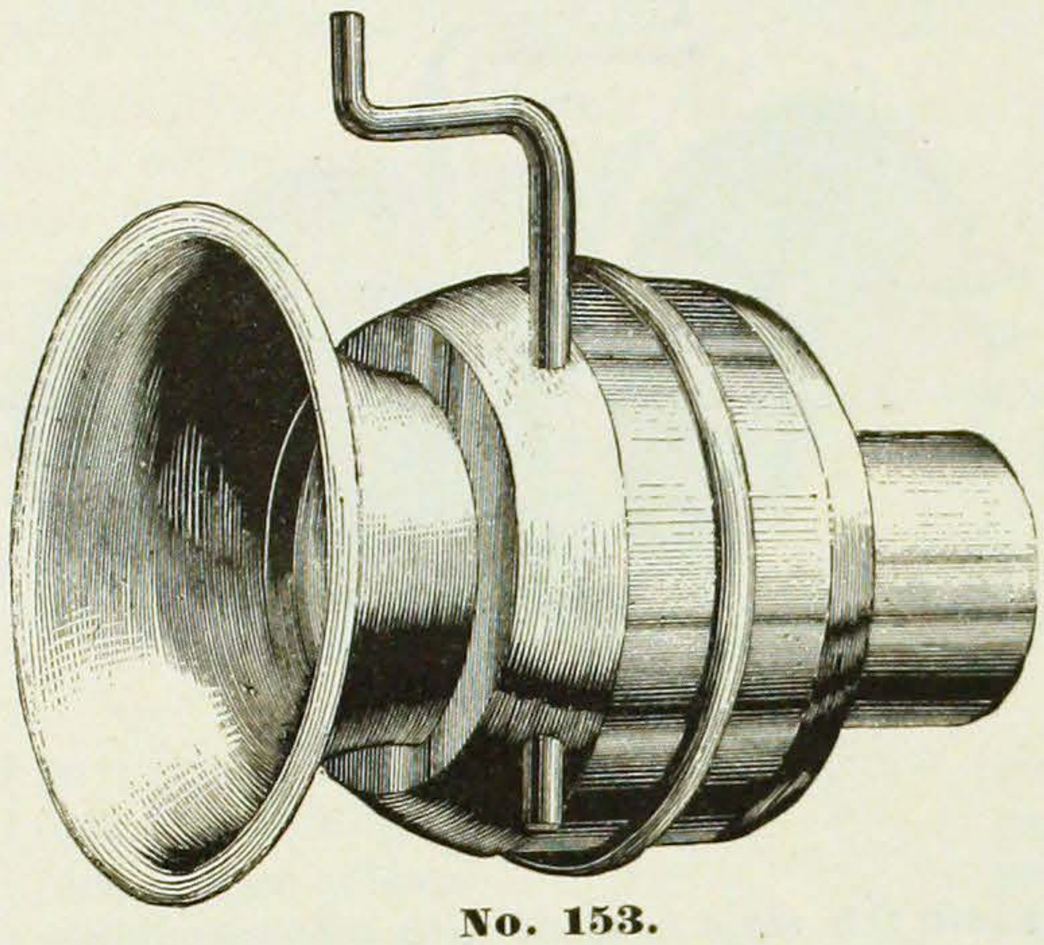
The Workmanship and Material are of the very best.

Sizes	**8-qt.**	**10-qt.**	**14-qt.**	**18-qt.**	**24-qt.**	**32-qt.**
With Crank	$10.50	$13.00	$16.50	$21.00	$25.00	——
With Fly-wheel	13.00	16.00	20.00	25.00	30.00	37.50

Discount.....

The Beveled Speaking-Tube Whistle.

PATENTED DECEMBER 16, 1879.

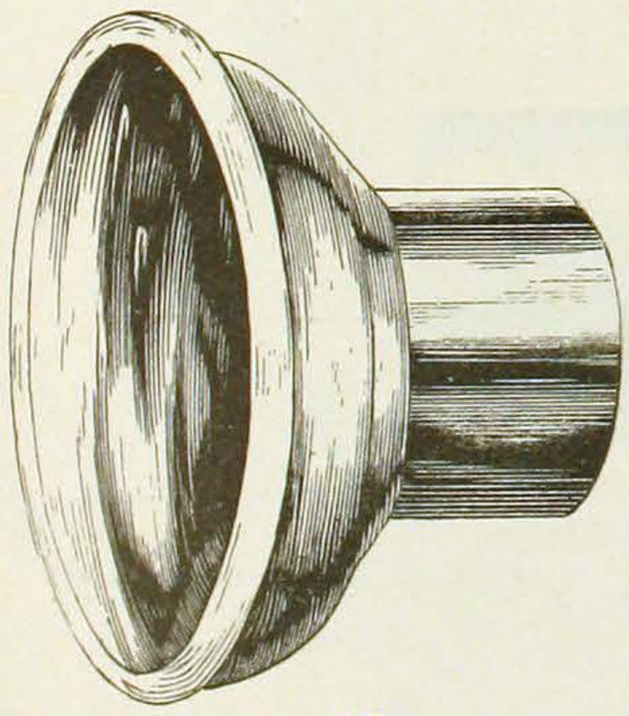


No. 153.
Exact size.

No. 152.	Whistle with Indicator, nickeled	per doz.	$12.00
No. 153.	Whistle without Indicator, nickeled	per doz.	11.00
No. 152½	Whistle with Indicator, gold bronzed	per doz.	14.00
No. 153½.	Whistle without Indicator, gold bronzed	per doz.	13.00
No. 154.	Whistle with Indicator, cast dark or gold bronze . .	per doz.	24.00
No. 155	Whistle without Indicator, cast dark or gold bronze . .	per doz.	24.00

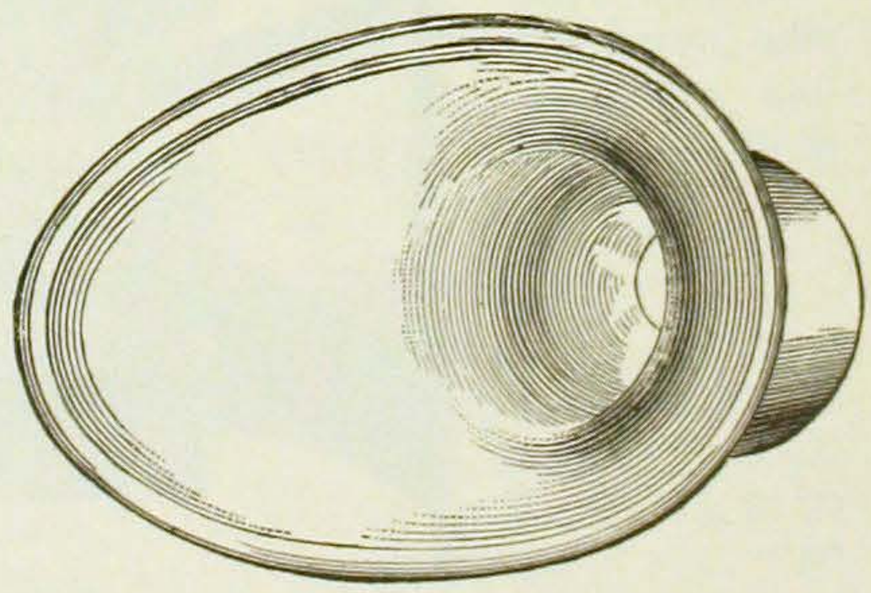
Discount.....

Porcelain Mouthpieces.



No. 33.

Round . . . . . per doz. $1.50

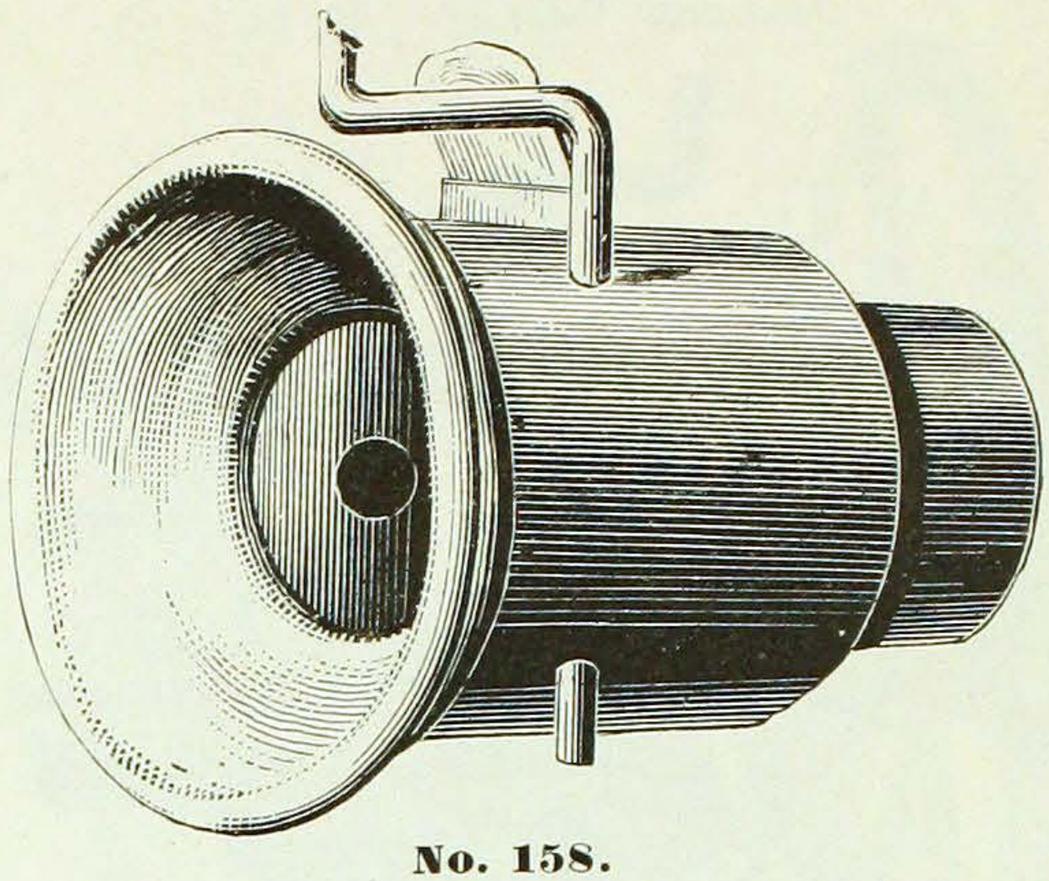


No. 34.

Oval . . . . . per doz. $1.50

Discount.....

The Round Speaking-Tube Whistle.



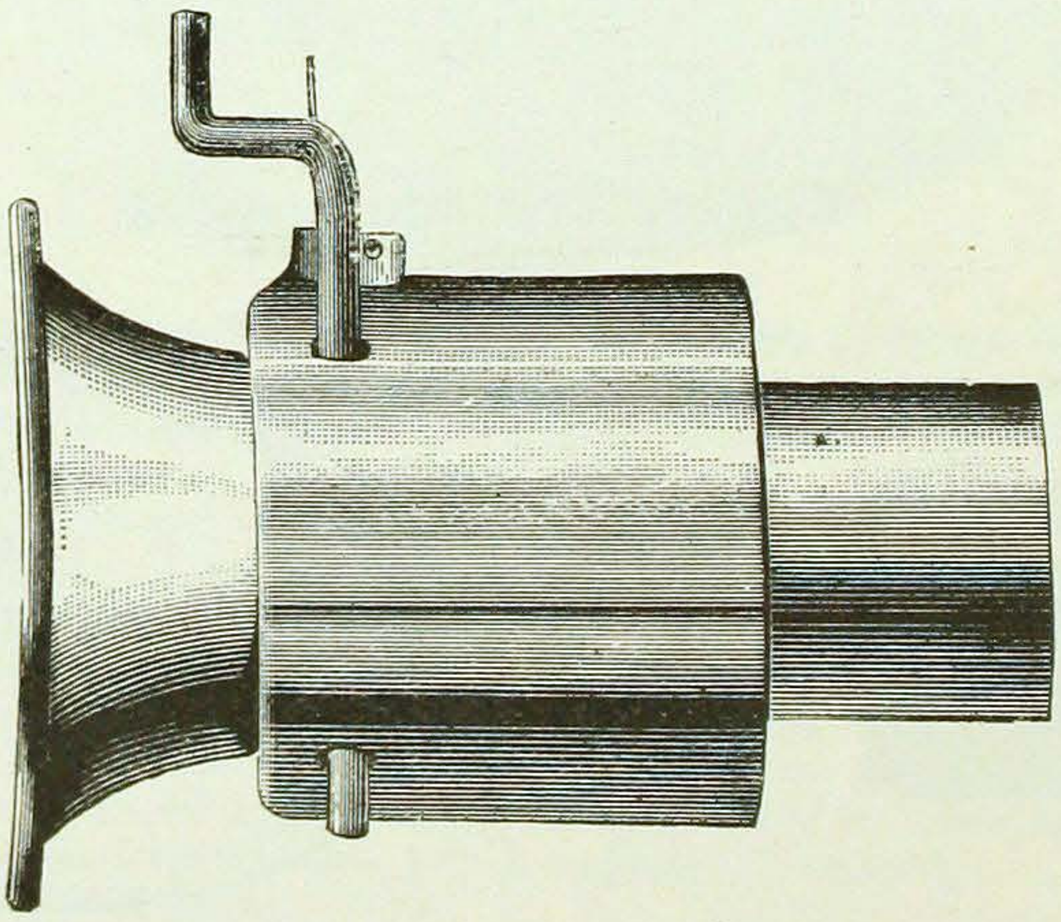
No. 158.
Exact size.

The Round Whistle this style is made with heavy porcelain mouthpieces. They are made in two styles, one with japanned body and the other with nickeled body.

No. 158. Whistle with Indicator, japanned body . . . . . per doz. $4.50
No. 159. Whistle without Indicator, japanned body . . . . . per doz. 4.00

Discount.....

Round Metal Whistle.

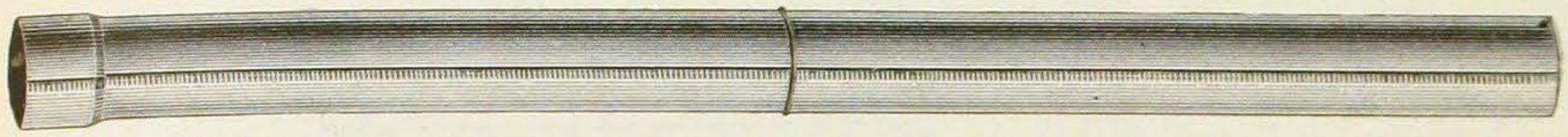


No. 158½.

No. 158½. With Indicator, nickeled . . . . . per doz. $7.00
No. 159½. Without Indicator, nickeled . . . . . per doz. 6.00

Discount.....

Ritchie's Lock Seam Standard Speaking-Tube.

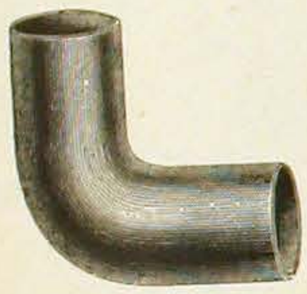


The use of the Speaking-Tube is of such value, as a modern convenience and as a great saver of time, that it has no equal in any respect. Being inexpensive it is within the reach of any person. It is essential in every building, from the two-story dwelling to the finest residence—from the apartment house to the largest hotels and factories.

We recommend the Ritchie Speaking-Tube as the best in every respect; it is made of the best charcoal tin has *one joint* only in a length of five feet, is double seamed and will carry sound a greater distance than any other tube in the market. This tube costs no more than the ordinary speaking-tube made of coke tin.

1 inch Tube, per 1000 feet, (in 5 feet lengths,) . . . . .
1 inch Tube, per 100 feet, (in 5 feet lengths,) . . . . .

Elbows.



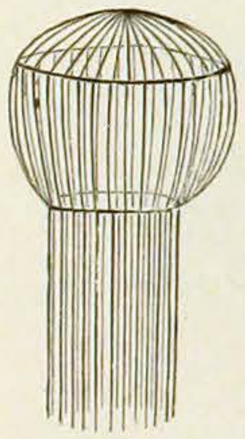
ROUND ELBOW.

1 inch, Square Elbows	per 1000
1 inch, Square Elbows	per doz.
1 inch, 3-piece Elbows	per 1000
1 inch, 3-piece Elbows	per doz.
1 inch, Round Elbows	per 1000
1 inch, Round Elbows	per doz.

The Standard Square Elbows are unusually strong, being re-enforced by a locking tongue.

All kinds of Speaking-Tube appliances furnished to order.

Spout Guards.



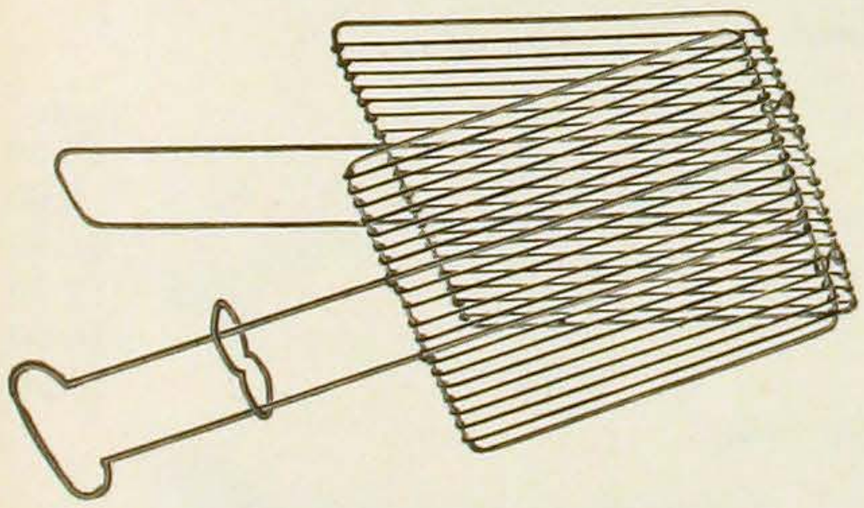
2 Inches diameter	per dozen $2.50
2½ Inches diameter	per dozen 2.75
3 Inches diameter	per dozen 3.00
3½ Inches diameter	per dozen 3.25
4 Inches diameter	per dozen 3.50
4½ Inches diameter	per dozen 3.75
5 Inches diameter	per dozen 4.00
6 Inches diameter	per dozen 4.50
8 Inches diameter	per dozen 10.00

Discount_____

Oyster Broilers.

No. 14 Wire.

SPACES BETWEEN BARS $\frac{3}{16}$ INCH ONLY.

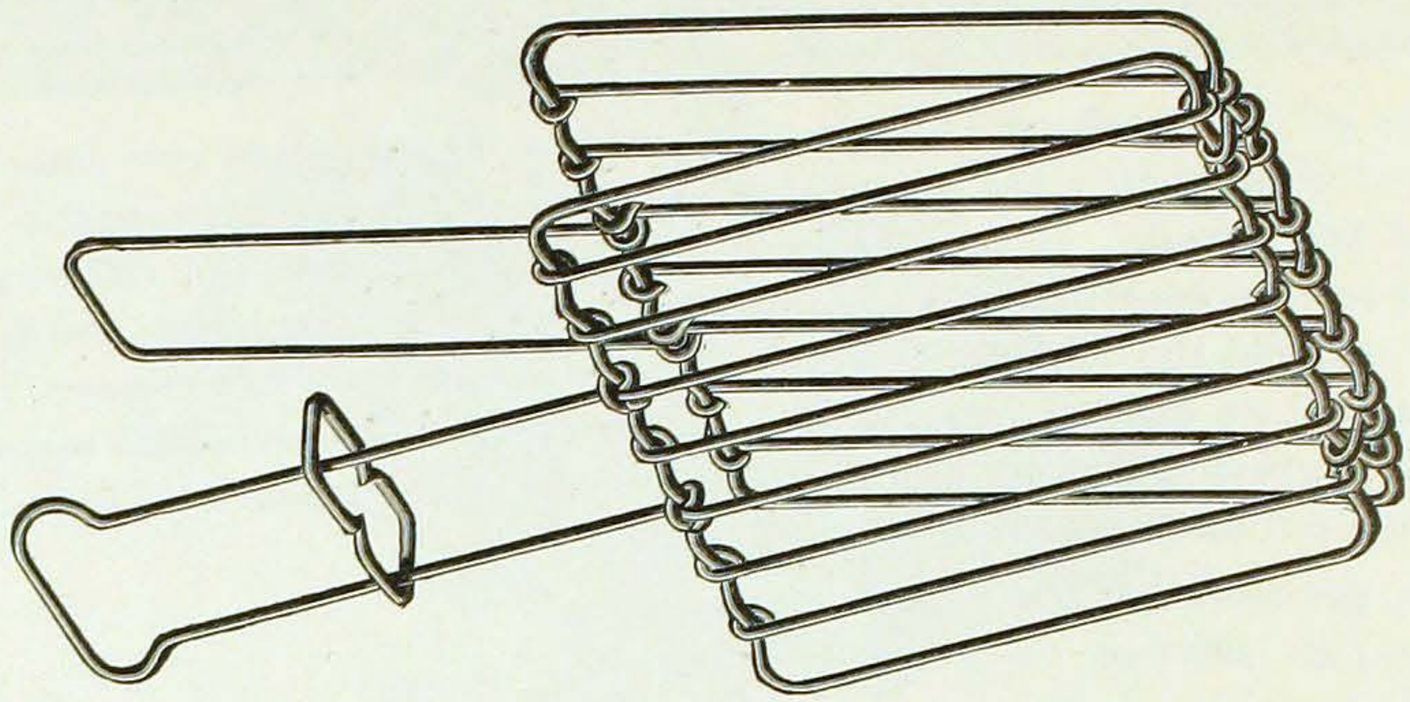


NO.		WIDE. LONG.	PER DOZ.
0.	6 inch . . .	(6 x 9) . .	$5.00
1.	8 inch . . .	(8 x 9) . .	6.00
2.	10 inch . . .	(10 x 9) . .	7.00
3.	12 inch . . .	(12 x 9) . .	8.00
4.	14 inch . . .	(14 x 9) . .	9.00

Discount.....

Reversible Broiler and Toaster.

MADE OF STEEL WIRE. RETINNED.



Light Broilers.—Bars No. 15 Wire.

No.	Long. Wide.	Per Doz.
0. 6 inch	9 x 6	$2.50
1. 8 inch	9 x 8	2.75
2. 10 inch	9 x 10	3.00
3. 12 inch	9 x 12	3.25
4. 14 inch	9 x 14	3.50

Discount.....

Heavy Broilers.—Bars No. 13 Wire.

No.	Long. Wide.	Per Doz.
0. 6 inch	9 x 6	$3.00
1. 8 inch	9 x 8	3.50
2. 10 inch	9 x 10	4.00
3. 12 inch	9 x 12	5.00
4. 14 inch	9 x 14	6.00

Discount.....

Extra Heavy Broilers.—Bars No. 11 Wire.

No.	Long. Wide.	Per Doz.
0. 6 inch	9 x 6	$5.00
1. 8 inch	9 x 8	5.50
2. 10 inch	9 x 10	6.50
3. 12 inch	9 x 12	7.50
4. 14 inch	9 x 14	8.50

Discount.....

Hotel Broilers.—Bars No. 9 Wire.

ALSO ADAPTED TO SALOON, SHIP AND FAMILY USE.

No.	Long. Wide.	No. of Bars.	Per Doz.
1. 8 inch	(7 x 8)	7	$8.00
2. 10 inch	(8 x 10)	13	9.50
3. 12 inch	(9 x 12)	15	11.00
4. 14 inch	(10 x 14)	17	12.50
5. 16 inch	(11 x 16)	19	14.50
6. 18 inch	(13 x 18)	21	16.50

Special Sizes Made to Order.

Discount.....



Wire Handle Strainers.

No. 1.	Size, 2½ inch . . .	per doz.	$2.50
No. 2.	Size, 3⅛ inch . . .	per doz.	3.00
No. 3.	Size, 4 inch . . .	per doz.	4.00

Discount.....



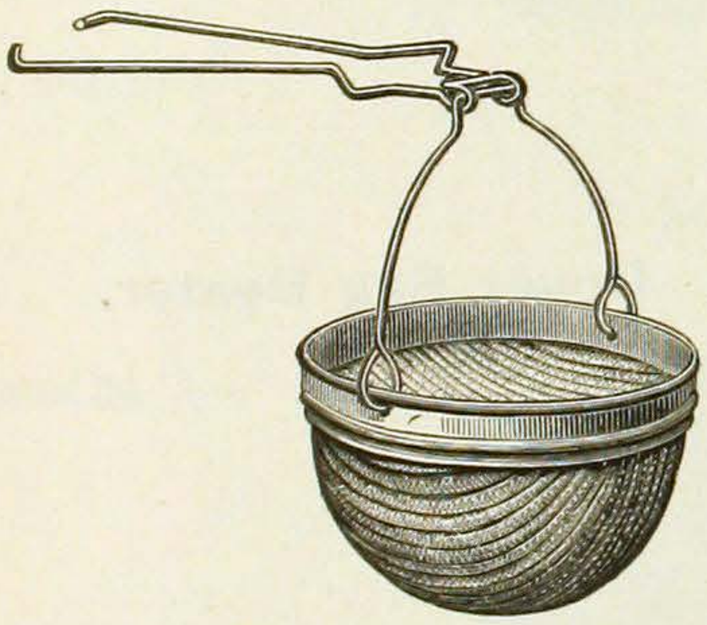
Wood Handle Strainers.

BLACK ENAMELED HANDLE.

No. 1.	Size, 2½ inch . . .	per doz.	$2.75
No. 2.	Size, 3⅛ inch . . .	per doz.	3.25
No. 3.	Size, 4 inch . . .	per doz.	4.25

Discount.....

These are for straining nursery and fancy drinks, starch, yeast, blanc-mange, custards, gravies, syrup, jellies, and for sifting sugar upon fruit, cake, pies, etc. Also for sifting salt into butter. Put up in fine paper boxes, containing one dozen of one kind.



Tea or Coffee Strainer.

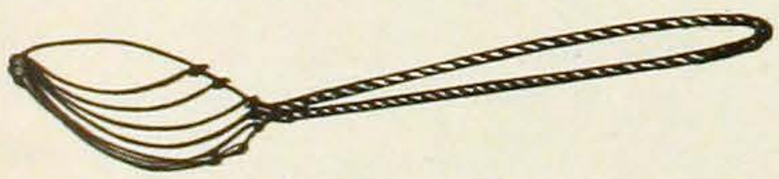
Per doz. $0.75



Wood Handle Egg Beater.

Black Handle	. . . .	per doz.	$1.25
Red Handle	. . . .	per doz.	1.00

Discount.....



All Wire Egg Beaters.

Per doz. $1.00

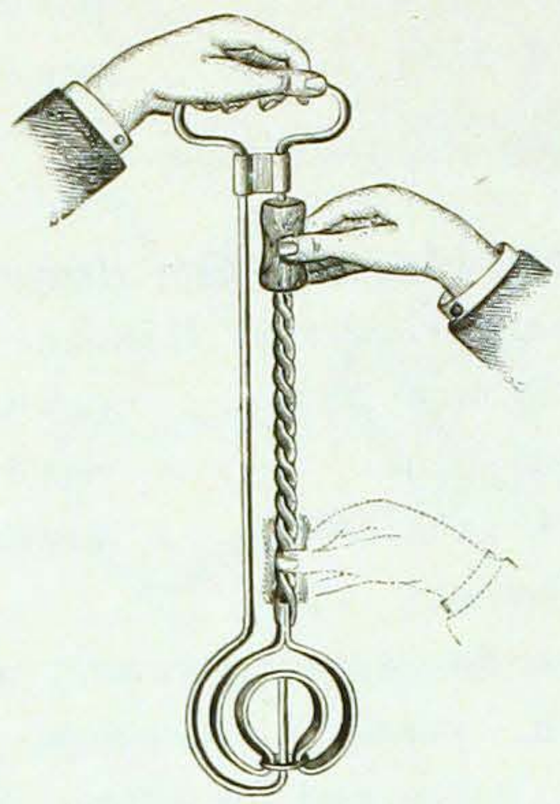
Discount.....



Tin Handle Egg Beaters.

Per doz. $1.00

Discount.....



Bryant's Patent Egg Beater.

PRACTICAL, SIMPLE, NOVEL.

1st.—It does its work perfectly.

2d.—It drives easily and without effort, by raising and lowering the button.

3d.—It has no objectionable cranks and gears.

4th.—It is made large to permit of its use in any material where whipping or beating is required, thus adding to its usefulness.

5th.—It is sold at a low price, and if compared with other beaters, is worth twice the money asked for it.

6th.—Anyone can see its merits by looking at the cut.

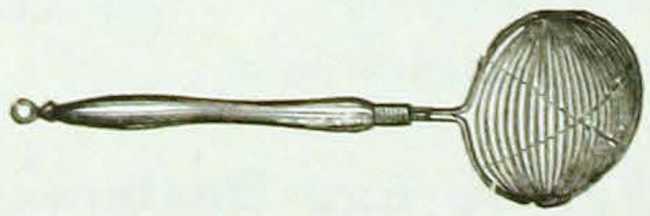
7th.—They are as well made as the most experienced workmen can make them, and always will be.

Per dozen . . . $2.00 net.



Dover, Egg Beater.

Per dozen. . . . . $2.50 net.



Wood Handle Vegetable Skimmer.

Per dozen $1.25

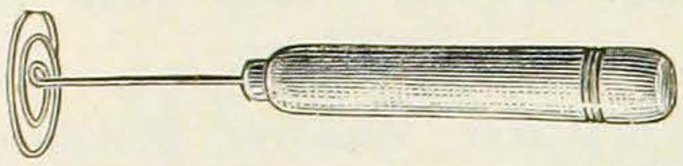
Discount.....



Star Bread Toaster.

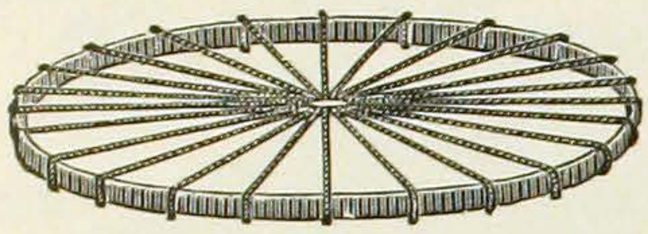
Per dozen $1.00

Discount.....



Eureka Potato Masher.

Per dozen $0.40

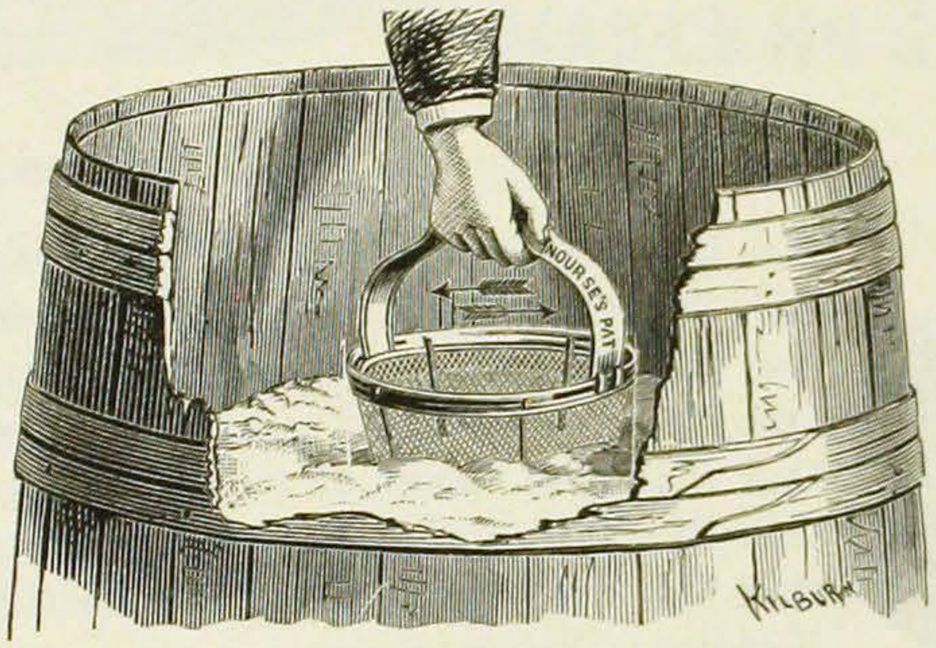


Standard Tea and Coffee Pot Stands.

Per dozen $1.75

Discount.....

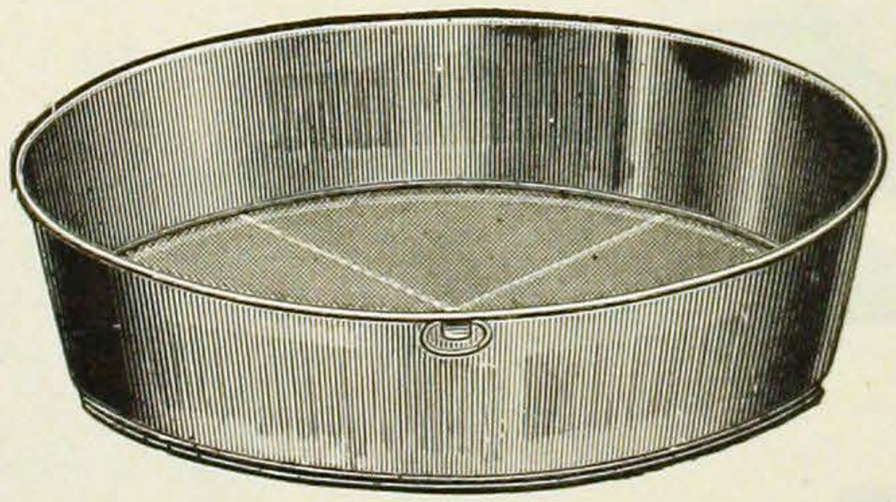
Improved Magic Flour Sifter.



Per dozen $2.25

Metallic Sieves.

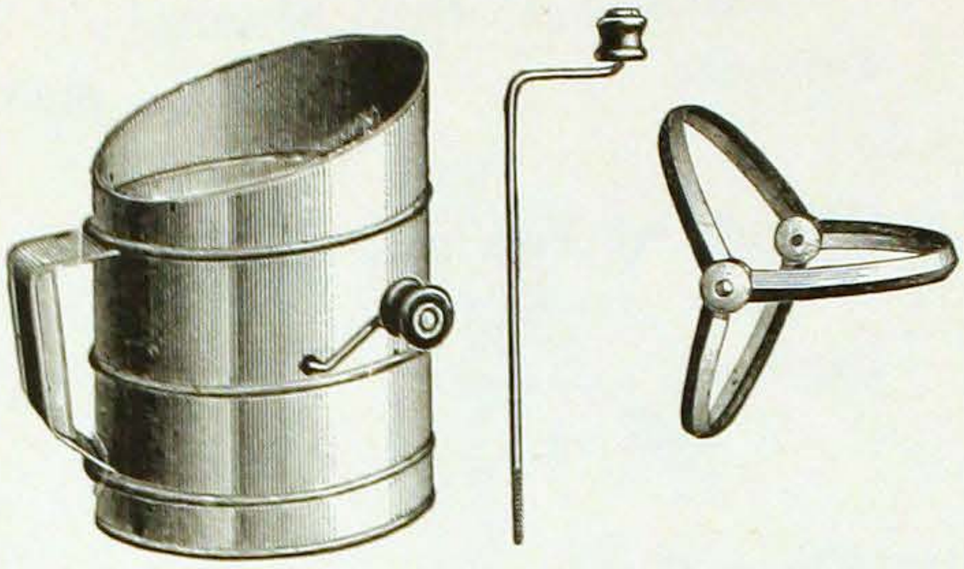
PATENTED.



Sizes of Mesh.	Blued Wire.	Tinned Wire.
No. 14	$4.00 doz.	$4.75 doz.
Nos. 14 and 16 (½ doz. each)	4.00 doz.	5.00 doz.
No. 16	4.00 doz.	5.00 doz.
Nos. 16 and 18 (½ doz. each)	4.12 doz.	5.12 doz.
No. 18	4.25 doz.	5.25 doz.
Nos. 18 and 20 (½ doz. each)	4.37 doz.	5.37 doz.
No. 20	4.50 doz.	5.50 doz.

Discount.....

One dozen in a case. Single or assorted numbers.



The Crown Flour and Meal Sifter,

Scoop, Mixer, Measurer, Weigher, Egg Beater, Rice Washer, Tomato, Pumpkin, Squash, Sugar, Starch, Wine and Fruit Strainer.

PATENTED MAY 16, 1871.

Licensed by the Hunter Sifter Mfg. Co. Can be taken apart to clean. Notice our New Agitator. It is the best.

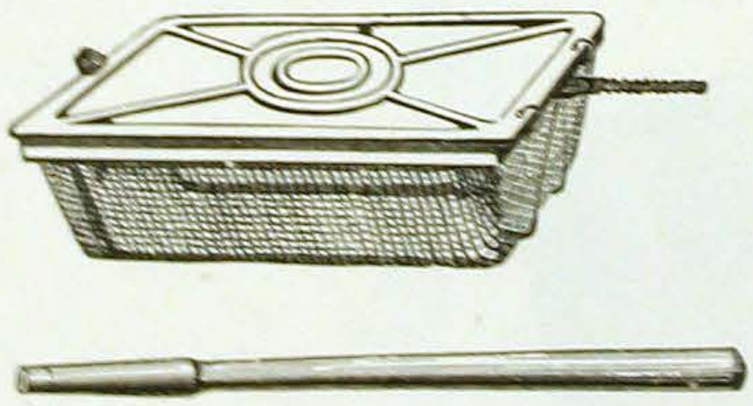
Per doz. $2.25



Coal Sieves.

Ash Rim Coal Sieves, 12 and 14 inches, assorted	per dozen	$1.40
Ash Rim Coal Sieves, 12 inches, assorted .	per dozen	1.20
Ash Rim Coal Sieves, 14 inches, assorted .	per dozen	1.50
Oak Rim Coal Sieves, 12 and 14 inches, assorted	per dozen	1.80
Oak Rim Coal Sieves, 12 inches, assorted .	per dozen	1.60
Oak Rim Coal Sieves, 14 inches, assorted .	per dozen	2.00
Oak Rim Coal Sieves, 15 inches, assorted .	per dozen	2.25
Handles in Sieves, Extra	per dozen	.50

Discount.....

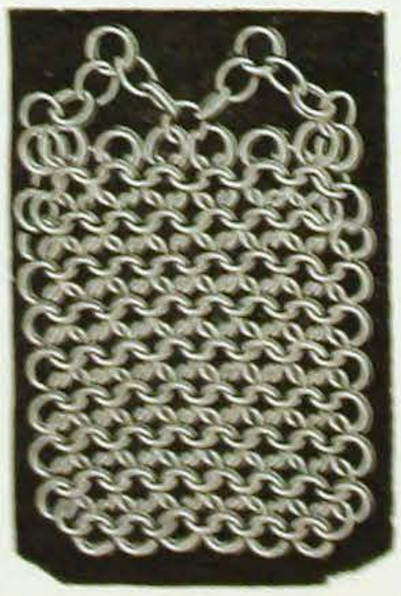


Patent Corn Popper.

This Corn Popper has a patent binding, double at the corners.

No. 1, Square, Screw Shank, Wire Braced, Wire Lid.

No. 2, Square, Screw Shank, Wire Braced, Tin Lid.



Bright Pot Cleaners.

TWO RING STEEL WIRE.

No. 1	per gross	$9.00
No. 2	per gross	18.00
No. 3	per gross	36.00
No. 4, Glove	per gross	36.00

HENIS' SELF-BASTING BROILER.



BASTES WHILE BROILING!

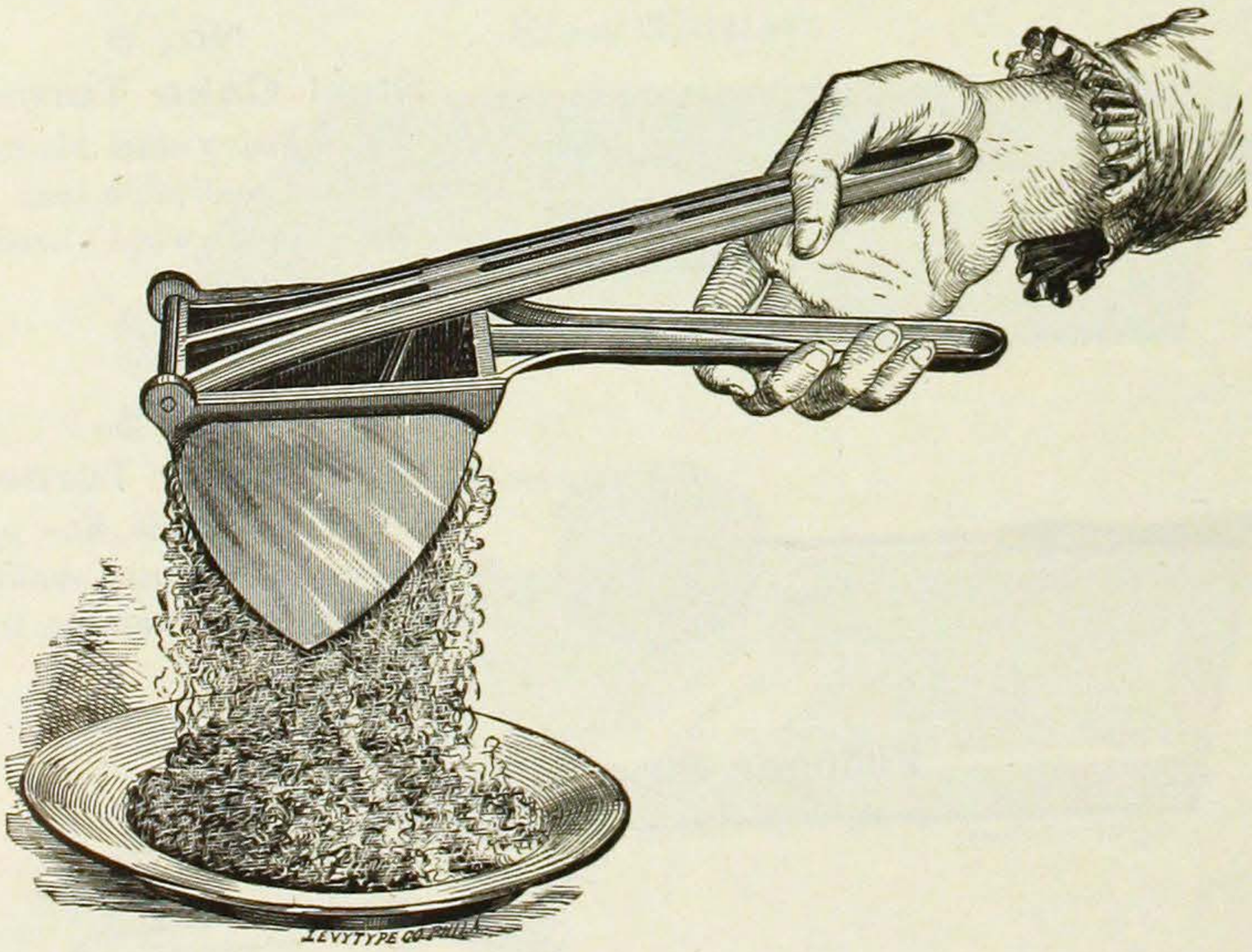
USES THE GRAVY!

MAKES NO SMOKE!

No. 8.	Round, fits No. 8 Stove	per doz. $4.50
No. 9.	Round, (Corrugated) fits No. 9 Stove	per doz. 5.50
No. 11.	Oblong, (Corrugated) 9x11 inches	per doz. 6.50
No. 15.	Oblong (Corrugated) 9x15 inches	per doz. 10.00

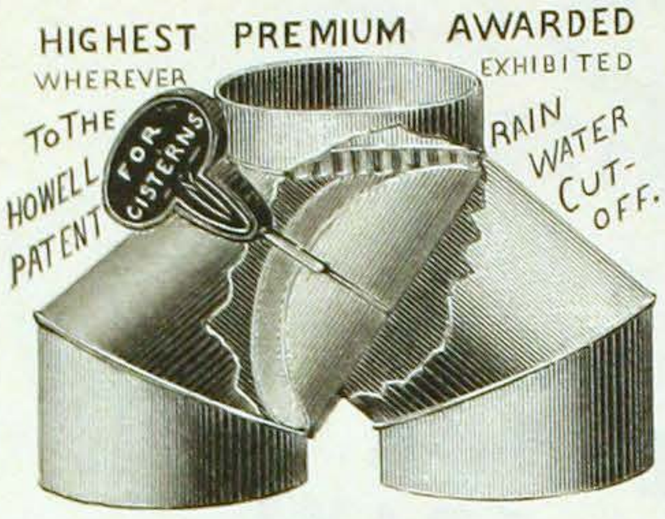
Henis' Fruit and Vegetable Press and Strainer

PATENTED NOVEMBER 1, 1881.



Per dozen $4.50

Howell Patent Rain Water Cut-Off for Cisterns.

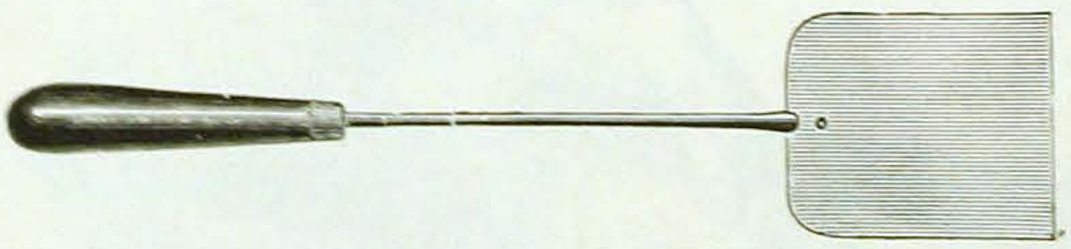


Represented by cut, for turning water into or off from the cistern. The cut shows all the pipes as being round, it having a portion of the shell removed, in order to show plainly the working of the bucket, or valve. The handle, which is an iron weight, insures the bucket remaining where placed, and entirely prevents its being turned by the downflow of water. It is shown in the cut as being on the left side, therefore throwing the water down the left branch. By merely turning the handle to the right side the flow of water is changed in that direction. The bucket or valve passes behind the rim at the top and overlaps the bottom, thus securing perfect water joints at both connections. The down spout of the building enters the top rim of the Cut-off, one at the lower branches leads to cistern, whilst the other can be arranged to convey the water into the waste pipe or gutter as desired.

They are made either of Tin or Galvanized Iron. All sizes manufactured, from 2½ to 24 inches.

2½ inches	per doz. $5.00
3 inches	per doz. 6.00
3½ inches	per doz. 8.00
4 inches	per doz. 9.00
5 inches	per doz. 14.00
6 inches	X Tin per doz. 20.00

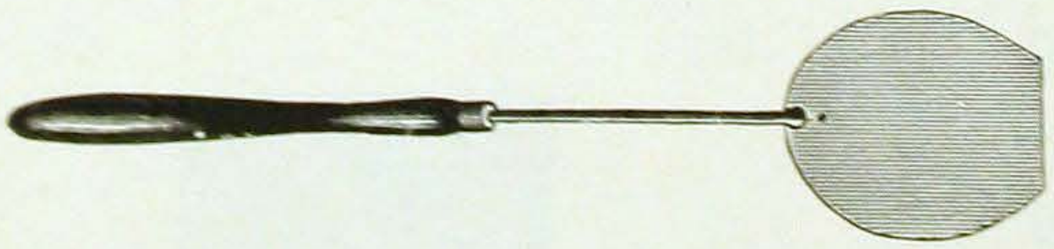
Discount.....



No. 3
Steel Cake Turners.

Extra heavy-steel blade, 3¼x4¼, with tinned malleable iron shanks, polished apple wood handles, in boxes, 1 doz. each.

Per doz. $1.00



No. 5
Steel Cake Turners.

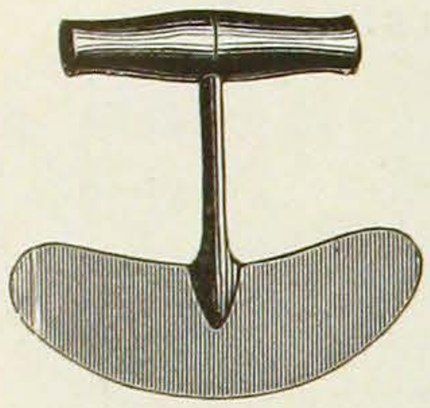
Oval steel blade, fine polished, tinned malleable iron shank, with lip, polished black handles, in boxes, 1 doz. each.

Per doz. $1.25

Fillingor Stop Motions.



Per gross $8.00

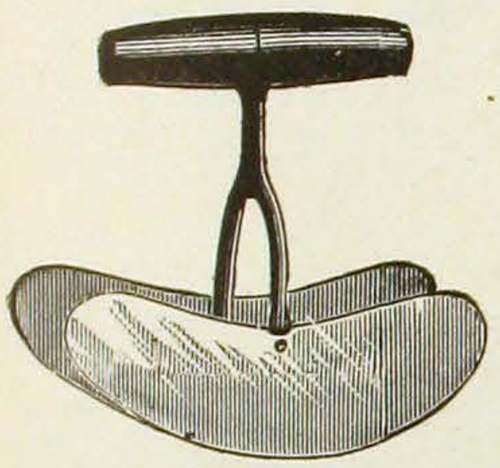


Improved Mincing Knives.

No. 1, polished steel blade and malleable iron lip shank, polished handles, in paper packages.

Per doz. $1.50

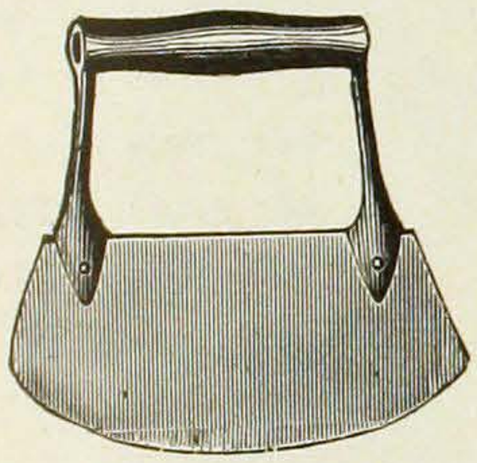
Discount.....



No. 4, two blades, heavy polished steel, with malleable iron lip shanks and polished apple wood handle, in boxes, 1 doz. each.

Per doz. $2.50

Discount.....

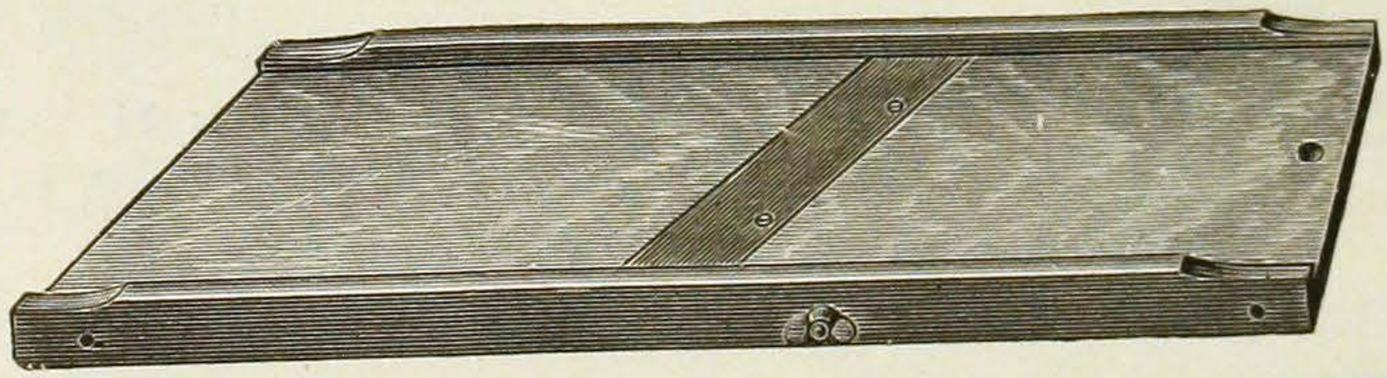


No. 5, fine polished steel blade, tempered, with iron handle, in boxes of 1 doz. each.

Per doz. $3.50

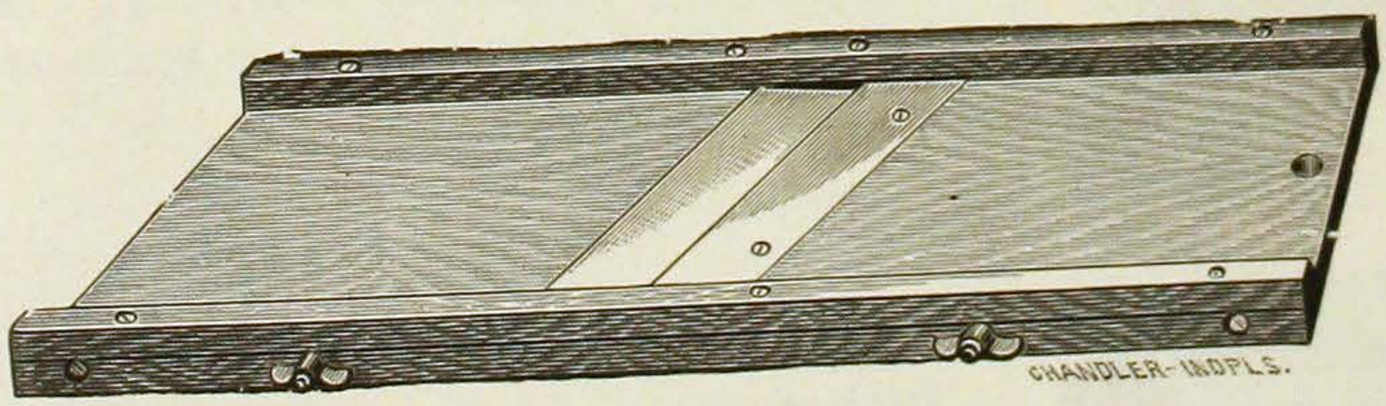
Discount.....

Slaw Cutters.



No. 1, 1 Knife . . . . . per doz. $3.50

Discount.....



No. 2, 2 Knives . . . . . per doz. $5.50

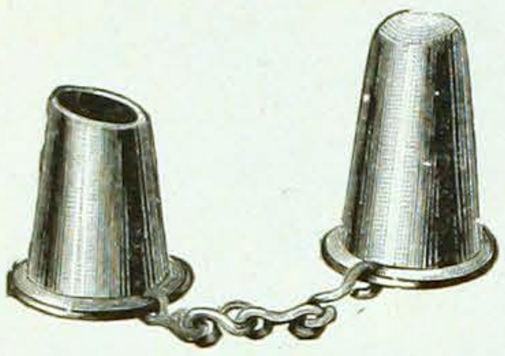
Discount.....



Extinguishers.

Brass Extinguishers, no Chain . .	per gross	$0.85
Brass Extinguishers, Chained, 1 Tube .	per gross	1.50
Brass Extinguishers, Chained, 2 Tubes .	per gross	2.50

Dlscount.....



Can Spout Extinguishers . . .	per gross	$2.37½

Discount.....



Can Screws.

ZINC.

½ inch	per gross	$4.00
¾ inch	per gross	4.50
1 inch	per gross	6.00
1¼ inch	per gross	8.00
1½ inch	per gross	12.00
1¾ inch	per gross	16.00
2 inch	per gross	20.00

Discount.....



BRASS.

Inch	½	¾	1	1¼	1½	1¾	2
Per gross	$4.50	$5.50	$7.50	$10.00	$13.00	$17.00	$21.00

Discount.....



TIN.

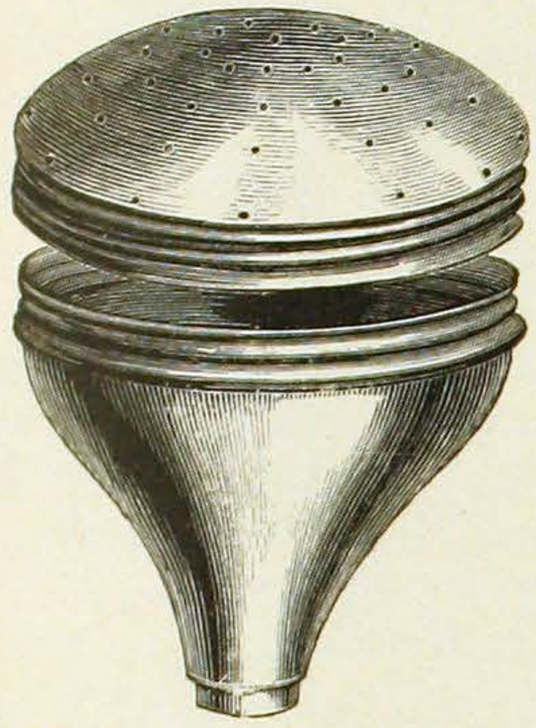
Inch	½	¾	1	1¼	1½	1¾	2
Per gross	$4.00	$4.50	$6.00	$8.00	$12.00	$16.00	$20.00

Discount.....



Tin Sprinkler Heads.

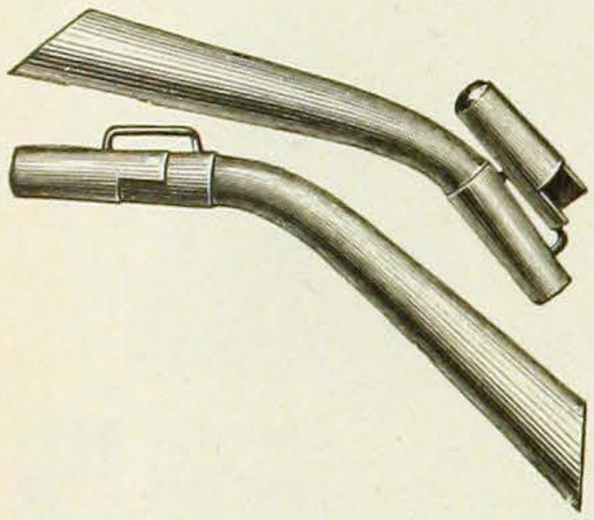
Inches,	**2¼**	**3**	**3½**	**4**
	For 1 & 2,	2, 3, 4,	6, 8, 10	12, 14, 16 Qts.
Price,	25c.	30c.	40c.	50c. per doz.



Zinc Sprinkler Heads.

No.	Per Doz.
000, 1⅜ inch	$1.00
00, 2 inch	1.25
0, 2½ inch	1.75
1, 3¼ ineh	2.00
2, 3¾ inch	2.50
3, 4¼ inch	3.00
4, 4¾ inch	4.00

Discount_____



Dover Can Spouts.

Nos.	**6**	**7**	**8**
Per gross	$7.00	$6.50	$6.00

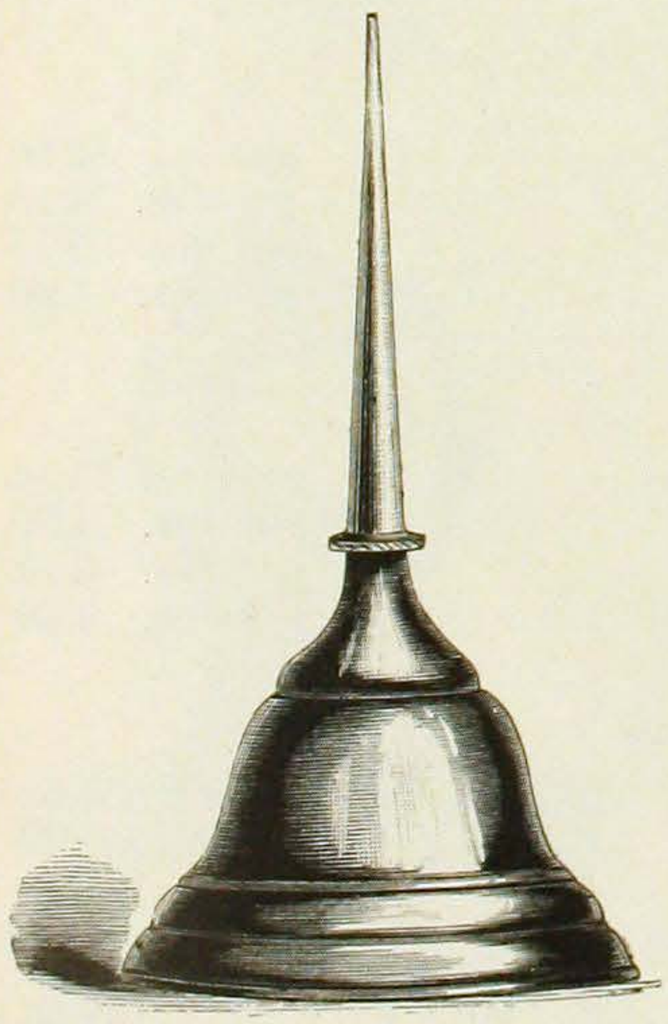
Discount.....



Metallic Trays.

18 in.	per doz.	$6.50
20 in.	per doz.	7.00
22 in.	per doz.	8.00
24 in.	per doz.	10.50
26 in.	per doz.	12.00

Discount.....



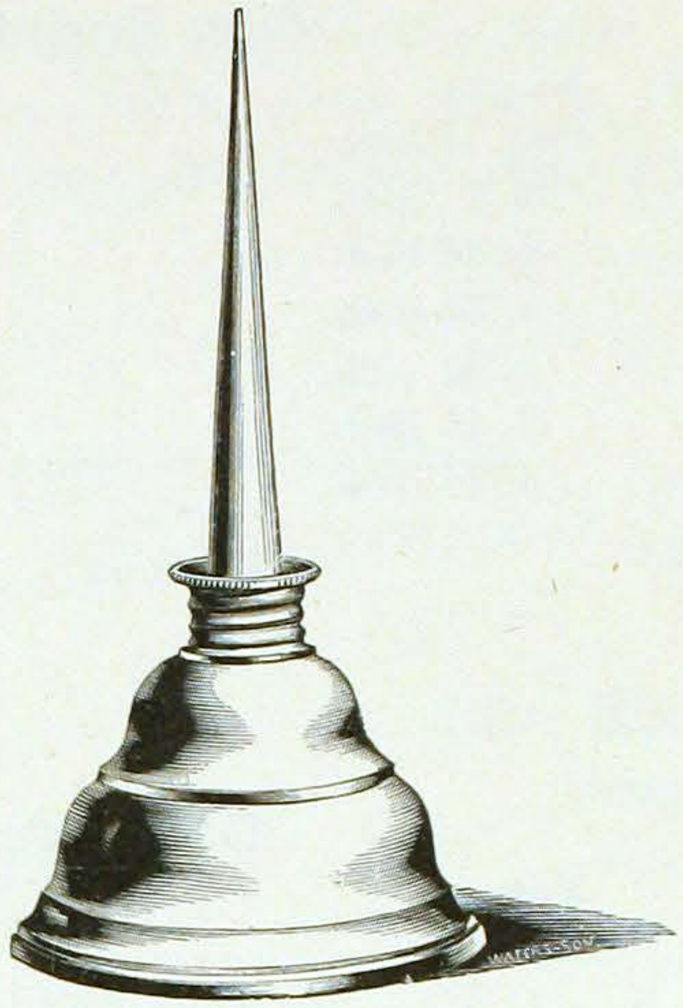
Patent Machine Oilers.

Tin.

No.	Per Doz.
0, Stamped Tin Oilers	$1.00
1, Stamped Tin Oilers	1.25
2, Stamped Tin Oilers	1.50
3, Stamped Tin Oilers	1.75
4, Stamped Tin Oilers	2.25
0, Stamped Tin Oilers, Brass Bottom	1.25
1, Stamped Tin Oilers, Brass Bottom	1.50
2, Stamped Tin Oilers, Brass Bottom	2.00
3, Stamped Tin Oilers, Brass Bottom	2.25
4, Stamped Tin Oilers, Brass Bottom	3.00

Discount_____

Chace's Patent Oilers.



Zinc, with Tin Bottoms.

No. 0	per doz. $1.00	No. 3	per doz. $1.75
No. 1	per doz. 1.25	No. 4	per doz. 2.25
No. 1½	per doz. 1.35	No. 5	per doz. 3.00
No. 2	per doz. 1.50	No. 6	per doz. 4.00

Discount_____

Zinc, with Brass Bottoms.

No. 0	per doz. $1.25	No. 3	per doz. $2.25
No. 1	per doz. 1.50	No. 4	per doz. 3.00
No. 1½	per doz. 1.75	No. 5	per doz. 4.00
No. 2	per doz. 2.00	No. 6	per doz. 5.00

Discount_____

Brass Oilers.

No. 0	per doz. $2.25	No. 3	per doz. $3.50
No. 1	per doz. 2.50	No. 4	per doz. 4.50
No. 1½	per doz. 2.75	No. 5	per doz. 5.75
No. 2	per doz. 3.00	No. 6	per doz. 7.00

Discount_____

Copper Oilers.

No. 0	per doz. $2.25	No. 3	per doz. $3.50
No. 1	per doz. 2.50	No. 4	per doz. 4.50
No. 1½	per doz. 2.75	No. 5	per doz. 5.75
No. 2	per doz. 3.00	No. 6	per doz. 7.50

Discount_____

Sewing Machine Oilers.

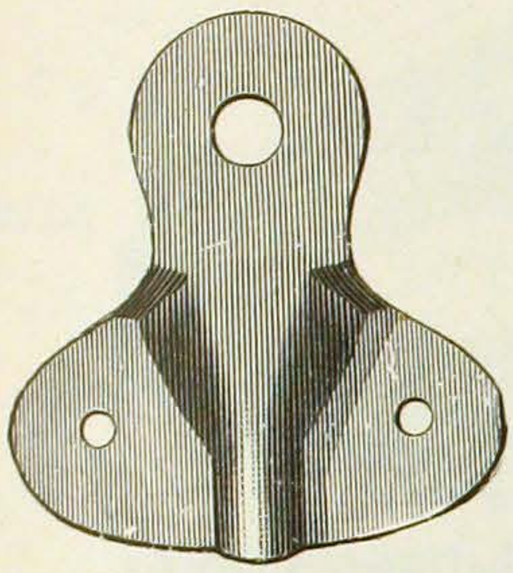
	Tin.	Zinc.		Tin.	Zinc.
Per gross	$9.00	$10.00	Per doz.	.90	.90

Discount_____

Mowing Machine Oilers.

Per gross	$20.00	Per doz.	$2.00

Discount_____

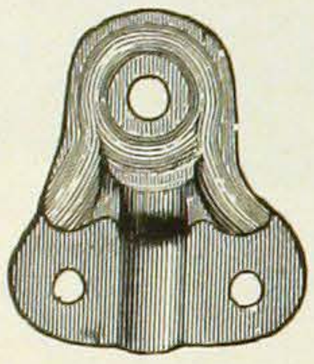


Kettle Ears.

EXTRA HEAVY, RETINNED, "IRON CLAD."

No.	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Per gross pairs	.50	.60	.80	$1.00	$1.25	$1.75	$2.00	$2.25

Discount.....



Eureka Kettle Ears.

No. 0	per gross pairs	$ .80
No. 1	per gross pairs	.88
No. 2	per gross pairs	1.00
No. 3	per gross pairs	1.35
No. 4	per gross pairs	1.70
No. 5	per gross pairs	2.15

Discount.....

Made of tin plate from XXXX to XXXXXX.

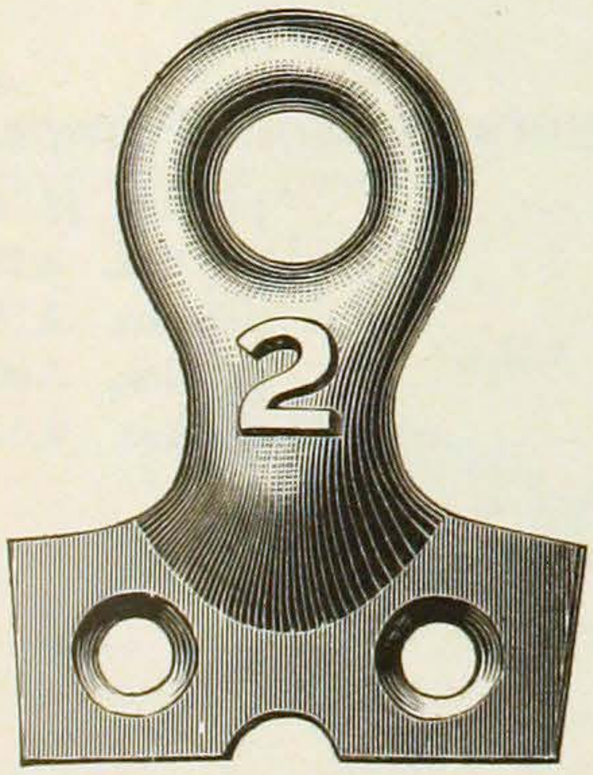


Eureka Can Ears.

No. 1	per gross pairs	$ .80
No. 2	per gross pairs	1.00
No. 3	per gross pairs	1.35
No. 4	per gross pairs	1.70
No. 5	per gross pairs	2.15

Discount.....

Same quality as kettle ears.



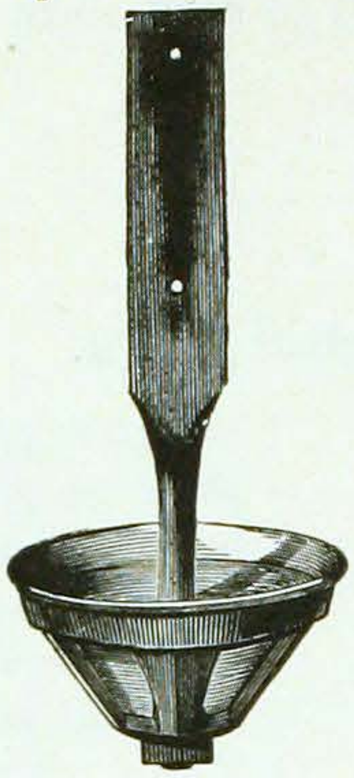
Heavy Malleable Ears.

No.	**1**	**2**	**3**	**4**
Per pound . . .				



Polished Brass Ears.

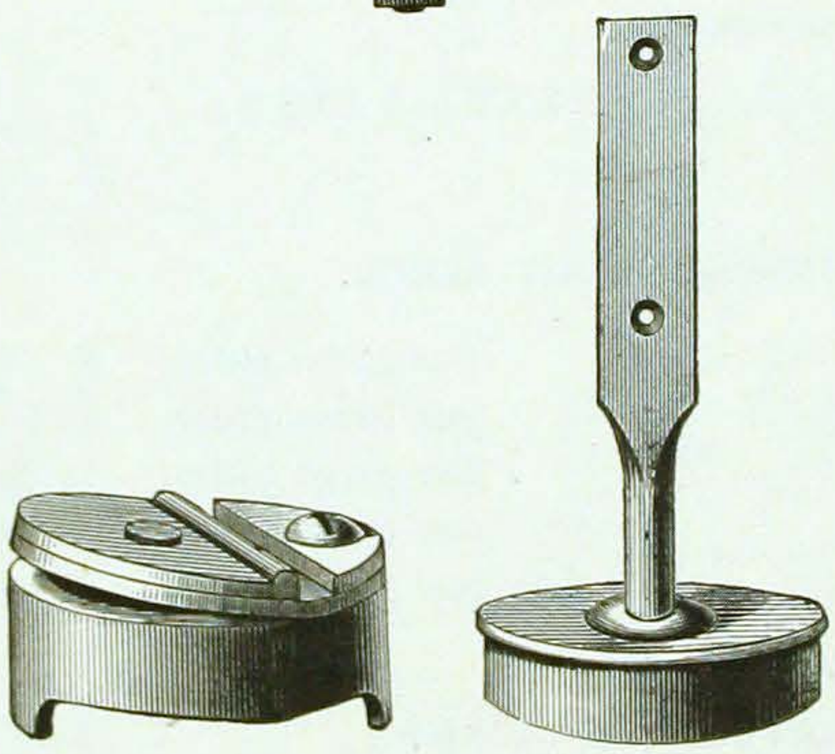
Per pair $0.15



Improved Plunger Valves.

3	Inch diameter . . .	per doz. $4.50
3¼	Inch diameter . . .	per doz. 5.00
3½	Inch diameter . . .	per doz. 5.50
4	Inch diameter . . .	per doz. 6.00

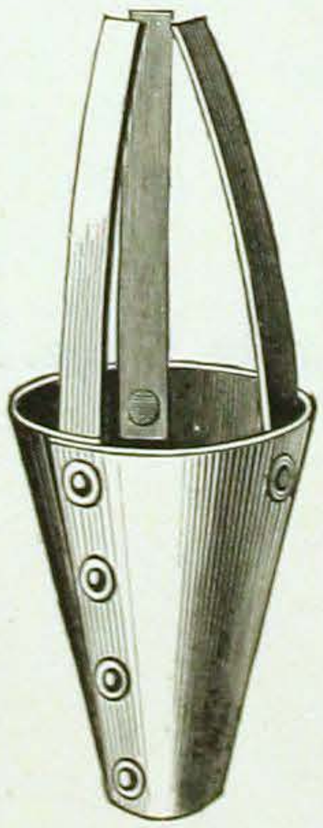
Discount.....



Oil & Liquor Valves & Plungers.

1¼	Inch diameter . .	per doz. pairs, $4.50
1½	Inch diameter . .	per doz. pairs, 5.00
1¾	Inch diameter . .	per doz. pairs, 5.50
2	Inch diameter . .	per doz. pairs, 6.00
2½	Inch diameter . .	per doz. pairs, 7.00

Discount.....



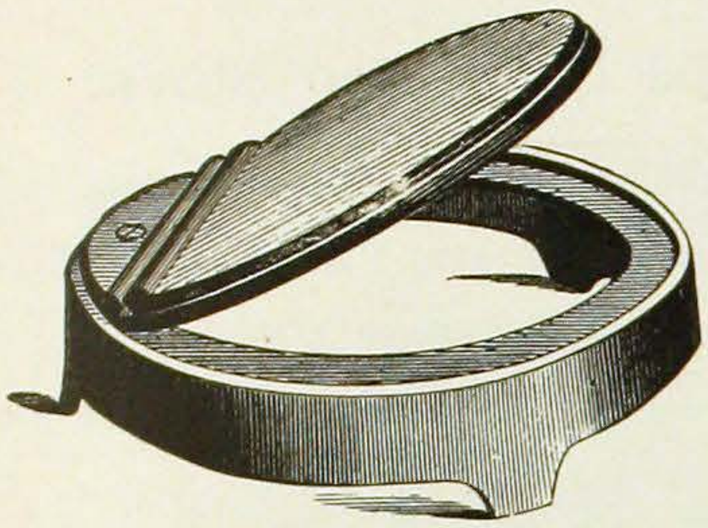
Leather Plungers for Boat Pumps.

3	Inch diameter . . .	per doz. $2.75
3½	Inch diameter . . .	per doz. 3.25
4	Inch diameter . . .	per doz. 3.75
4½	Inch diameter . . .	per doz. 5.00
5	Inch diameter . . .	per doz. 6.00

Other sizes to order.

Made of the best leather and well riveted.

Discount.....

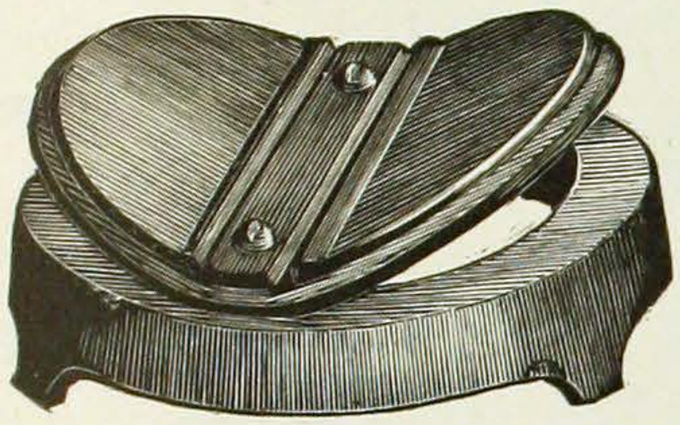


Patent Improved Pump Valves.

3	Inch diameter . . .	per doz. $4.50
3¼	Inch diameter . . .	per doz. 5.00
3½	Inch diameter . . .	per doz. 5.50
3¾	Inch diameter . . .	per doz. 6.00
4	Inch diameter . . .	per doz. 6.50

Clappers for repairs, half the above prices.

Discount.....



Improved Double Clapper Valves.

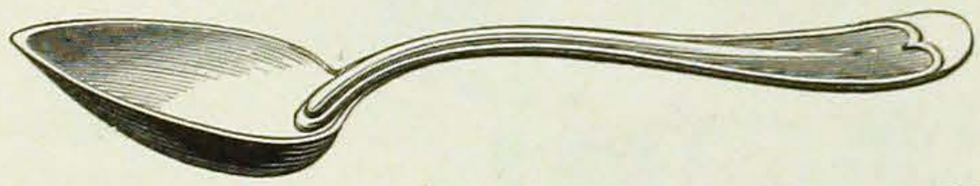
4	Inch diameter, double clappers,	per doz. $7.50
4½	Inch diameter, double clappers,	per doz. 10.00
5	Inch diameter, double clappers,	per doz. 12.00
5½	Inch diameter, double clappers,	per doz. 14.00
6	Inch diameter, double clappers,	per doz. 17.00

Clappers for repairs, half the above prices.

Discount_____

Threaded Tea Spoons.

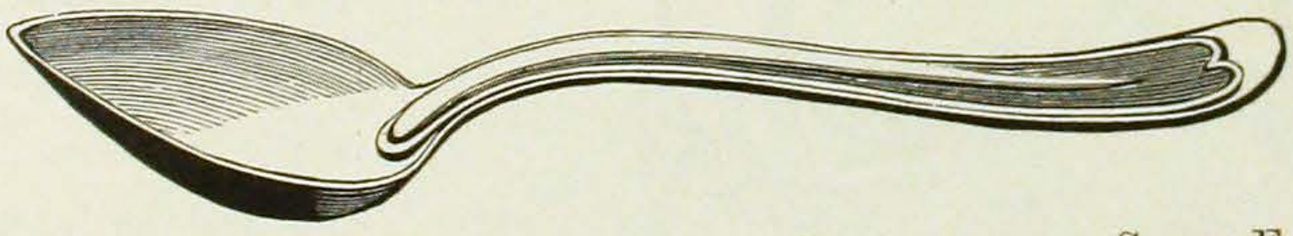
SOLID.



No.	**70**	**305**	**310**	**320**
Inches	6	6	6	6
Retinned, per gross	$1.45	$1.75	$2.00	$2.25

Discount.....

Threaded Table Spoons.



	SOLID STRONG.				SOLID EXTRA STRONG.		
No.	**140**	**40**	**41**	**42**	**20**	**21**	**22**
Inches	7¾	7¾	8	8¼	7¾	8	8¼
Retinned, per gross . . .	$2.75	$3.25	$3.75	$4.00	$4.50	$5.50	$6.50

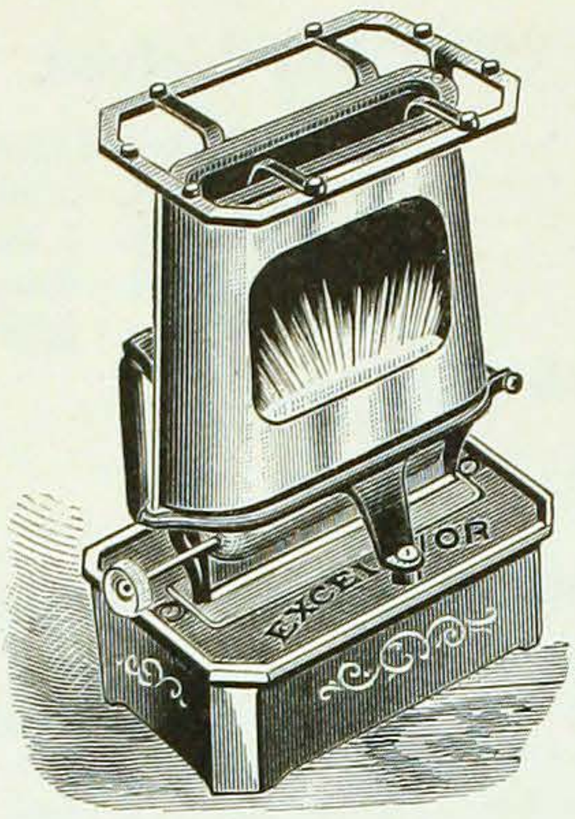
Discount.....

Solid Threaded Basting Spoons.



Inches	**10**	**12**	**14**	**16**	**18**	**20**
Extra Strong Solid, per doz. . . .	.60	.70	.80	$1.10	$1.20	$1.50

Discount.....



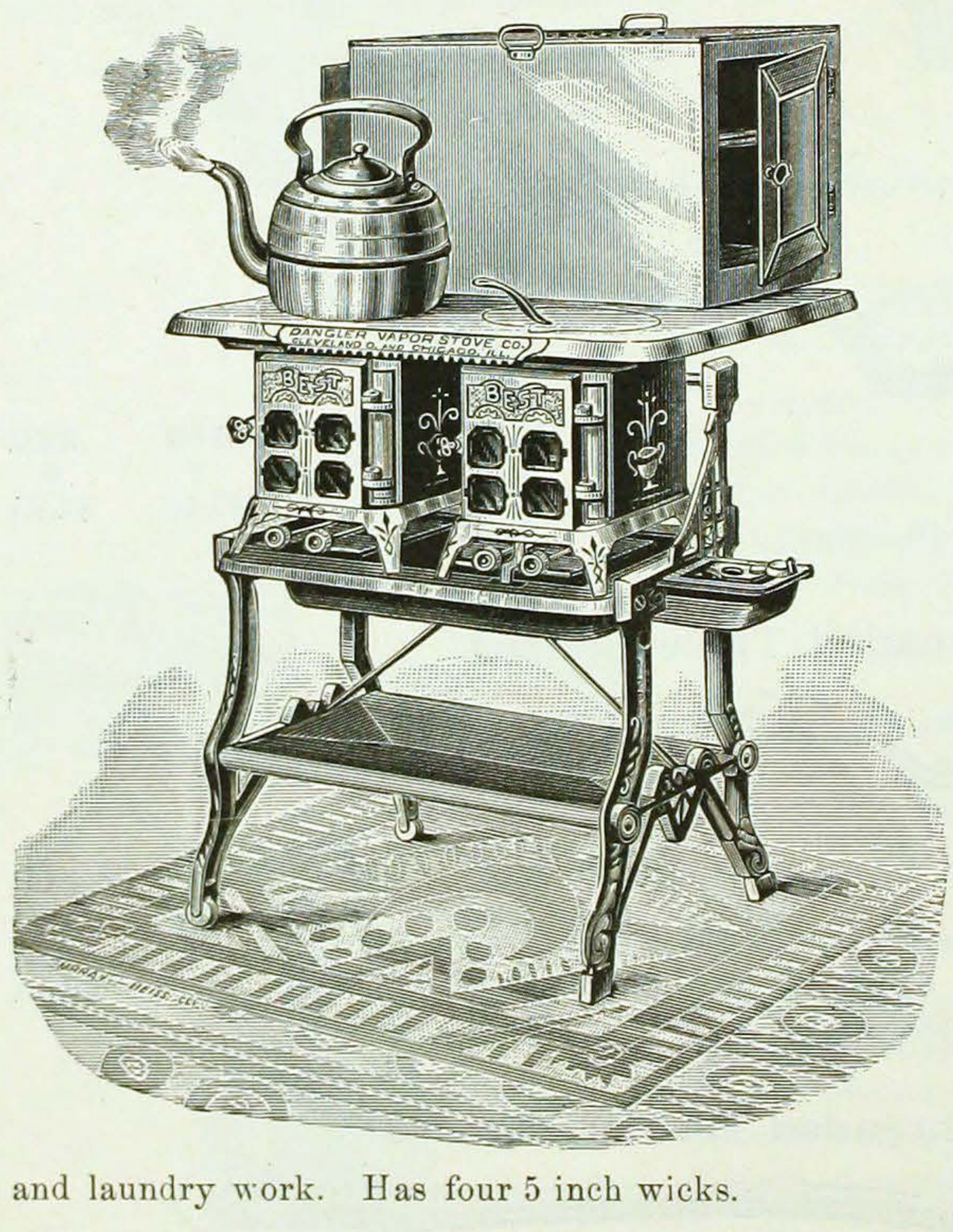
Excelsior Oil Lamp and Stove.

This wonderful combination of light and heat is so constructed that it can be used as a Lamp, furnishing a powerful and pleasant light for reading, sewing, etc., and at the same time a powerful heat, and will boil a quart of water in less than ten minutes.

Weight of Lamp Stove 5 pounds.

Price . . . . . each $2.00

Discount.....



No. 40. Dangler Oil Range.

This Range has a heating power and top surface of the ordinary large Cook Stoves, having four 8 inch covers, so arranged that the top (including the Stove) can be turned back, the covers remaining in place, and has the sliding or draw-out chimneys. The great advantage of these chimneys is the wick can be trimmed and lighted without turning back the stove. The tank can be filled from the outside, as shown in the cut. This stove has no equal for doing all kinds of cooking, baking, broiling and laundry work. Has four 5 inch wicks.

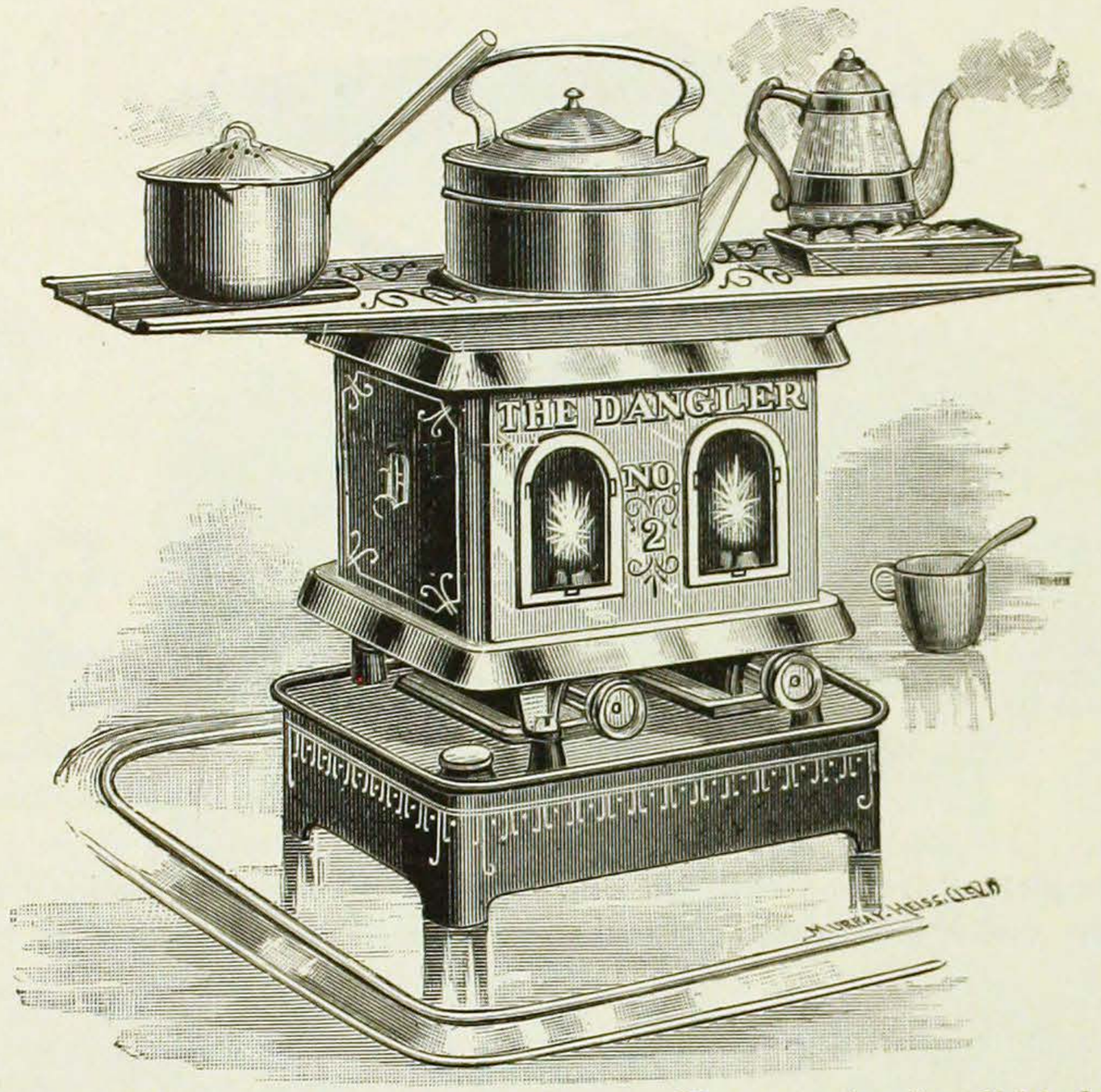
Price . . . . . each $17.00

Range Oven . . . . . each 4.00

Discount.....

No. 2. 2 Burner Dangler Oil Stove.

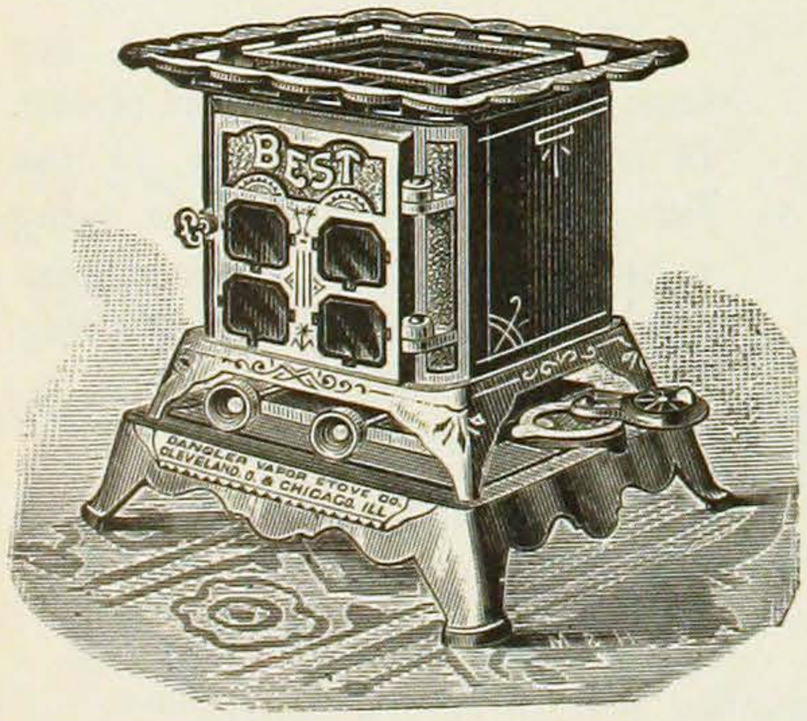
WITH EXTENSION TOP.



Neat stove, nicely finished, as the cut shows. Has capacity for all kinds of cooking, Complete in every respect, and has two 4 inch wicks.

Price with Extension Top	each $7.00
Price without Extension Top	each 5.50
Oven	each 3.00

Discount.....



No. 20. 2 Burner Dangler Oil Stove.

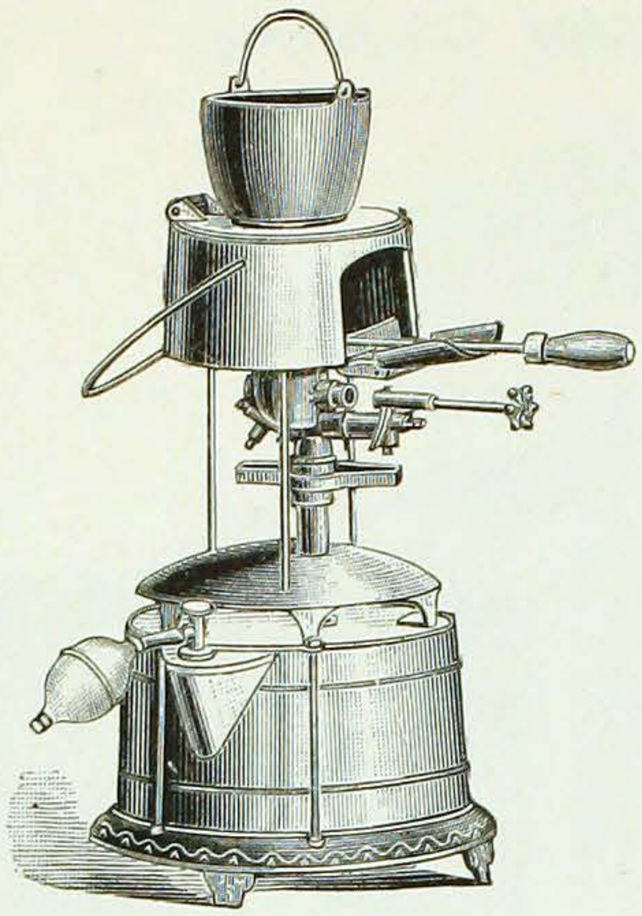
WITH OR WITHOUT EXTENSION TOP.

Above cut represents the finest and most complete stove of its size, ever put on the market. Has all the features of the larger stoves, and is constructed with sliding chimneys and two 5 inch wicks. Indispensable for a small family.

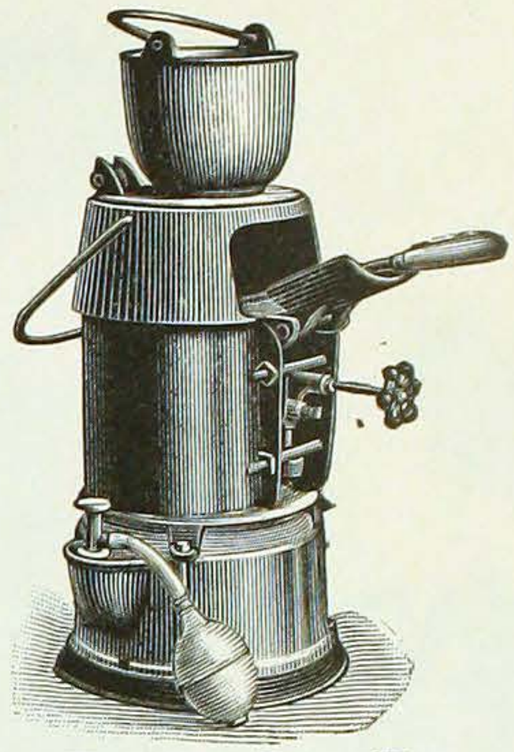
Price with Extension Top . .	each $8.00
Price without Extension Top .	each 6.50
Oven.	each 3.00

Discount.....

The Dangler Furnace.



For Bench Use.



For Out-Door Use.

No Dirt. No Noise. No Smell. Absolutely no danger of Explosion.

We furnish two sizes; one especially for out-door use, being 7 lbs. lighter, with brass tank—same capacity, power and price—the burner being protected by a shield, so that it can be used for any out-door purpose.

The burner is entirely new, and the most powerful ever invented. It will heat a 6 lb. copper in less than four minutes and melt 10 lbs. solder in eight minutes. The burner is noiseless, which removes the serious objection heretofore existing against furnaces and fire-pots. The furnace as arranged is absolutely non-explosive, being provided with an air blast, which supplies the necessary pressure to force the fluid to the burner, instead of the elevated tank, and being made portable, can be used on roofs, or wherever a furnace can be used. It is conceded by experts, that for power, convenience, and economy the Dangler Combined Furnace and Fire-pot is the first absolute success.

Price, including Pot	$7.50 net.
Lighting attachment extra	1.75 net.



Universal Lanterns.

With Coal Oil Burner and Candle Socket.

Per doz.

With 2-Tube Burner and Candle Socket.

Per doz.

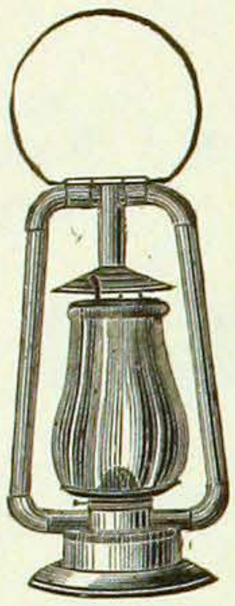
With Candle Socket only.

Per doz.



Police Lanterns.

No.	1	2	3
Inches	2½	3	3½
Per doz.			

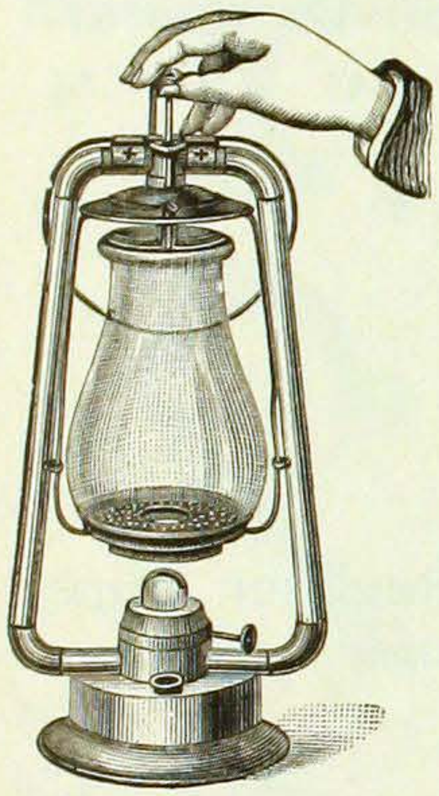


Tubular Lanterns.

FOR KEROSENE.

No. 0	**With Guards.**	**Without Guards.**
Per doz . . .		

Burner is No. 1, $\frac{5}{8}$-inch wick. The No. 0 Tubular Lantern is the leading size.

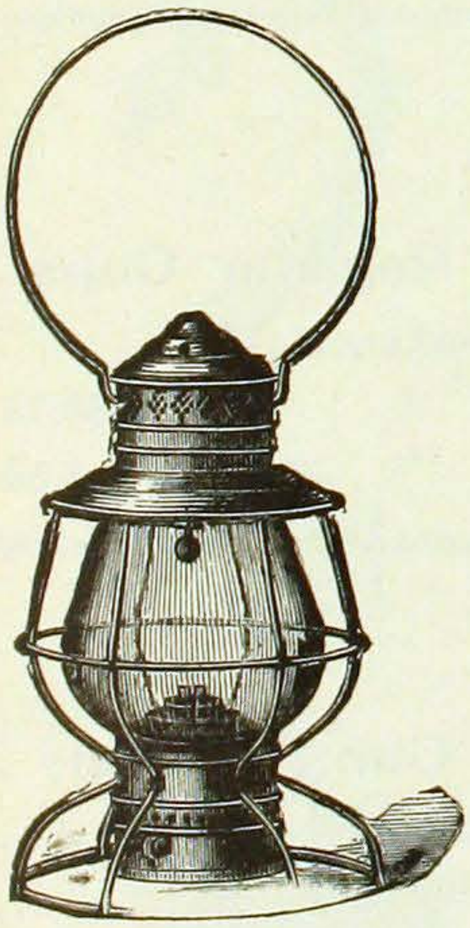


Safety Lift Wire Tubular Lantern.

FOR KEROSENE.

No. 0	**With Guards.**	**Without Guards.**
Per doz. . . .		

Burner is No. 0, $\frac{3}{8}$-inch wick.

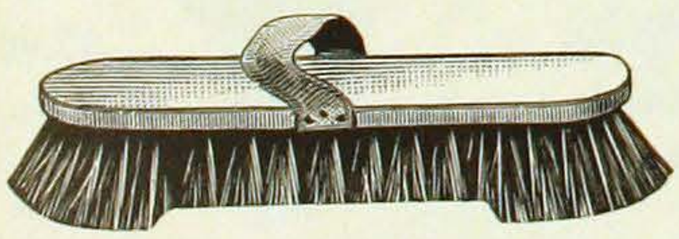


No. 12 Giant (R. R.) Lantern.

IMPROVED.

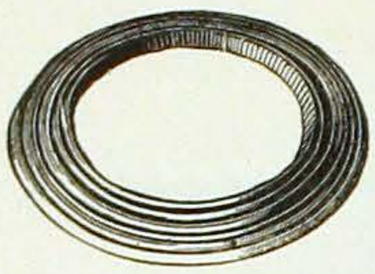
Per doz. $9.00

Takes No. 39 R. R. Globe.



Stove Brushes.

No.	**1**	**2**	**3**
Per doz.	$3.25	$4.00	$4.50



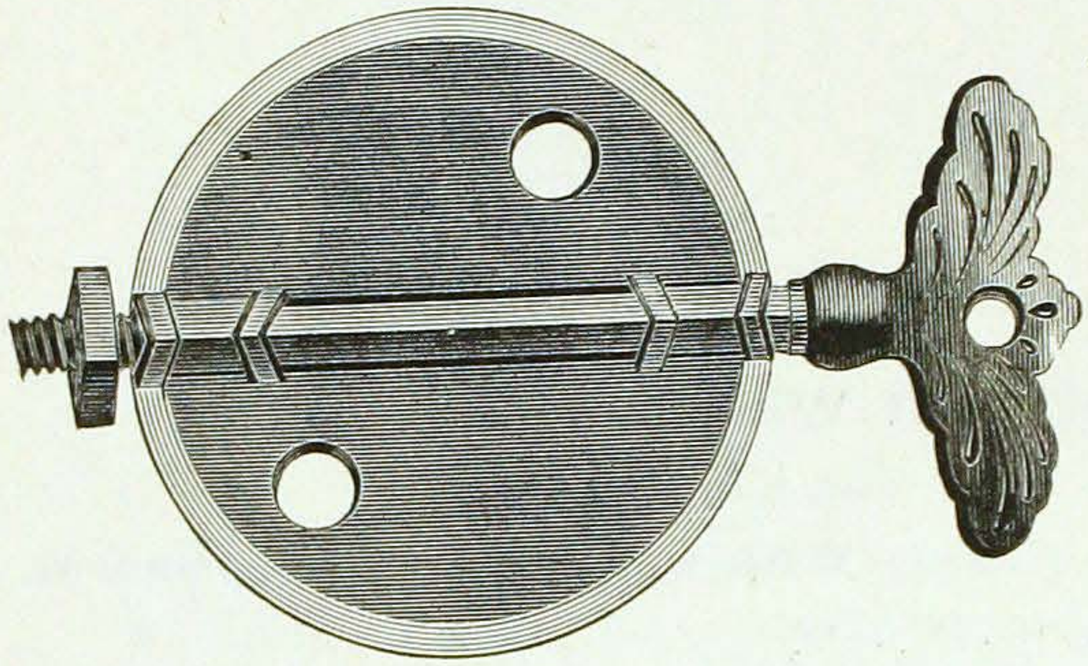
Stove Pipe Collars.

ZINC.

Inches	**4**	**4½**	**5**	**5½**	**6**	**7**	**8**	**9**	**10**
Per doz.									

BRASS.

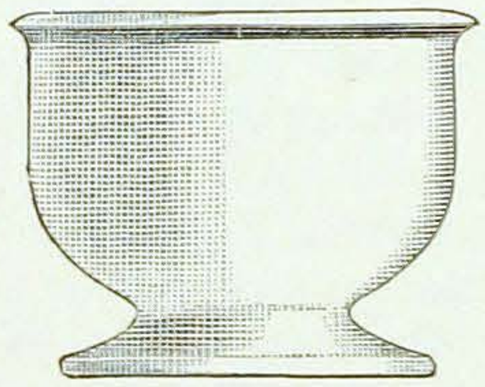
Inches	**4**	**4½**	**5**	**5½**	**6**	**7**	**8**	**9**	**10**
Per doz.									



Stove Pipe Dampers.

Inches	**4**	**4½**	**5**	**5½**
Per pound				
Inches	**6**	**7**	**8**	**9**	**10**
Per pound					





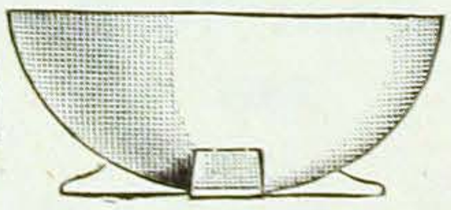
Porcelain Register Cups.

DEEP.

Per doz.	$0.75
Per gross	7.50

Outside dimensions, diameter 2¾ inches, depth 1⅞ inches.





Porcelain Register Cups.

SHALLOW.

Per doz.	$0.75
Per gross	7.50

Outside dimensions, diameter 2⅜ inches, depth ¾ inch.



Register Cups, Nickel-plated.

SHALLOW.

Per doz.	$1.25
Per gross	13.00

Outside dimensions, diameter 2⅜ inches, depth ¾ inch.

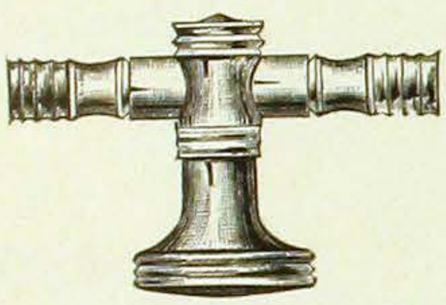
Damper Rods.

Inches	**4**	**6**	**8**	**9**	**12**
Per doz.	$0.40	$0.40	$0.40	$0.40	$0.40
Per gross	4.00	4.00	4.00	4.00	4.00



Damper Knobs—Brass, Nickel-plated.

Per doz.	$0.75
Per gross	7.50



Damper Handles—Brass, Nickel-plated.

Per doz.	$1.75
Per gross	19.00

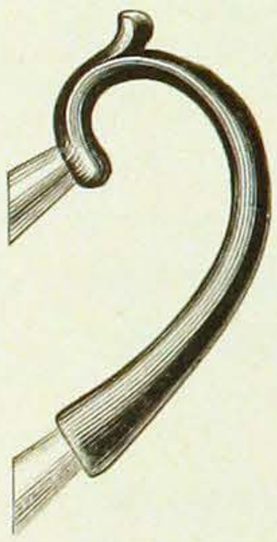


Tea Pot Handles.

TIN JAPANNED.

Halsteds.

Nos.	**210**	**215**
Per doz.	$0.50	$0.60
Per gross	5.25	6.25

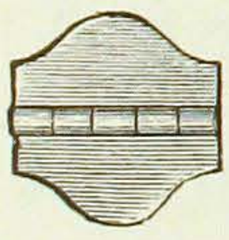


Tea Pot Handles.

SOLID IRON JAPANNED, TIN TIPPED.

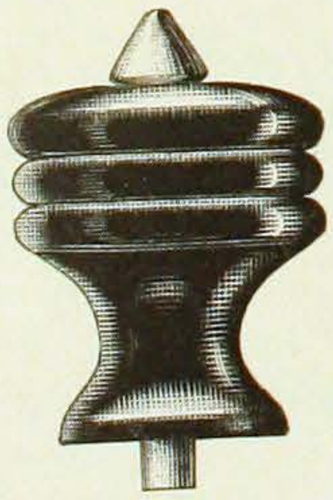
Nos.	**10**	**15**	**20**
Inches	4¾	5½	6½
Per gross	$9.00	$9.50	$10.75

Discount.....



Hinges, Tea Pot—Double.

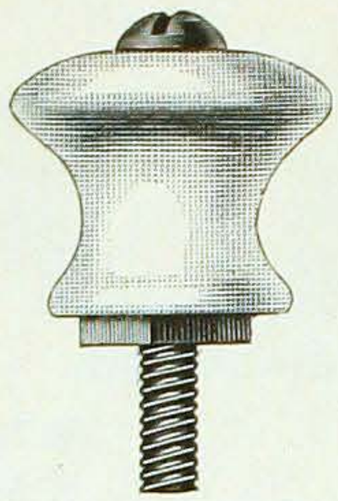
	Tin.	Brass.
Per gross	$0.50	$1.00



Ajax Tea Pot Knobs—Enameled.

PATENTED FEBRUARY 9, 1886.

Nos.	**1**	**2**	**3**	**4**	**5**
Per gross	$0.55	$0.60	$0.65	$0.75	$0.80



Porcelain Knobs.

Inches	½	⅝	¾	⅞
Per gross, with spindles	$1.40	$1.45	$1.50	$1.60
Per gross, without spindles	0.75	0.80	0.85	0.90

Inches	**1**	**1⅛**	**1¼**	**1½**
Per gross, with spindles	$1.70	$1.80	$2.00	$2.25
Per gross, without spindles	0.95	1.00	1.50	1.75



Dippers—Copper.

Per pound . . . . . .

Weight per doz. 4¾ pounds.



Dippers—Brass.

Per pound . . . . . .

Weight per doz. 4¾ pounds.

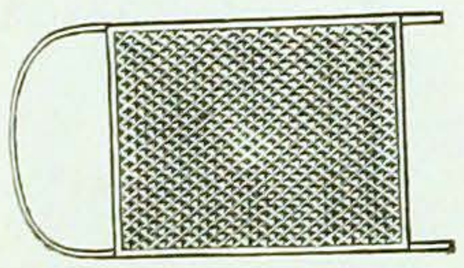


Dipper Handles.

MALLEABLE.

Per doz. $2.00

Length 15½ inches.



Iron Frame Graters.

Nos.	**1**	**2**
Sheet	¼	½
Per doz.	.55	.95

Brass Strainer Cloth.

Medium. No. 50 . . . . . per square foot

Extra Fine. No. 60 . . . . . per square foot

Braziers' Solder.

Coarse . . . . . per pound

Fine . . . . . per pound

Galvanized Hoop Iron.

Inches	½	⅝	¾	⅞	**1**	**1⅛**	**1¼**	**1½**	**1¾**	**2**
Per pound										

Bucket Handles.

	Small.	Large.	Enameled Small.	Enameled Large.	Polished Large.
Per gross	.50	$1.00	.75	$1.25	$2.75

Sad Irons.

SHARP OR ROUND.

Sizes	**4**	**5**	**6**	**7**	**8**	**9**	**pound per pair.**
Per pound							

Copper Nails.

Inches	**1**	**1¼**	**1½**	**1¾**	**2**	**2½**	**3**	**3¼**	**3⅜**	**3½**
	2	3	4	5	6	8	10	12	16	20 d
Per pound .										

Copper Tacks.

Inches	**⅜**	**½**	**⅝**	**¾**	**⅞**	**1**	**1⅛**	**1¼**	**1½**	**1¾**	**2**
Ounces	4	8	12	16	18	20	22	24	30		
Per pound											

Copper Case Nails.

Inches	**1½**	**2½**
Per pound		

Brass Floor Nails.

Per pound . . . . . .

Number of nails to the pound, 125.

Zinc Nails.

Inches	**¾**	**⅞**	**1**	**1¼**	**1½**	**1¾**	**2**
			2	3	4	5	6 d
Per pound							

Tinned Slating Nails.

Inches	**¾**	**⅞**	**1**	**1¼**	**1½**	**1¾**	**2**
			2	3	4	5	6 d
Per pound							

Galvanized Slating Nails.

Inches	**¾**	**⅞**	**1**	**1¼**	**1½**	**1¾**	**2**
			2	3	4	5	6 d
Per pound							

Black Slating Nails.

Inches	**¾**	**⅞**	**1**	**1¼**	**1½**	**1¾**	**2**
			2	3	4	5	6 d
Per pound							



SILVER MEDAL

FIRST PREMIUM

AWARDED BY

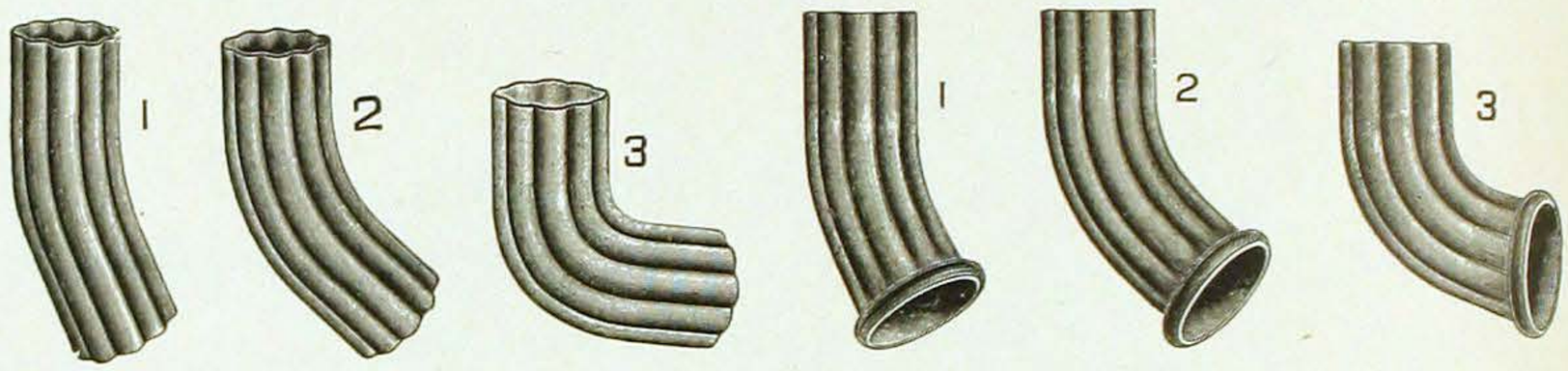
Franklin Institute,

Phila., 1885.

FOR



Ritchie's Patent Corrugated Expanding Conductor.



Galvanized Expanding Conductor.

ROUND OR SQUARE.



Inches	2	3	4	5	6
Per foot	$0.12	$0.15	$0.20	$0.25	$0.30

Discount.....

Ritchie's Patent Stamped Corrugated Galvanized Elbows and Shoes.

ROUND OR SQUARE.

Sizes	2 in.	3 in.	4 in.	5 in.	6 in.
No. 1, per doz.	$2.50	$2.75	$3.50	$4.25	$4.75
No. 2, per doz.	3.00	3.25	4.00	4.75	5.25
No. 3, per doz.	3.50	3.75	4.50	5.25	5.75

Discount.....

Copper Expanding Conductor.

ROUND OR SQUARE.

Inches	2	3	4	5	6
Per foot	$0.25	$0.33	$0.44	$0.55	$0.66

Discount.....

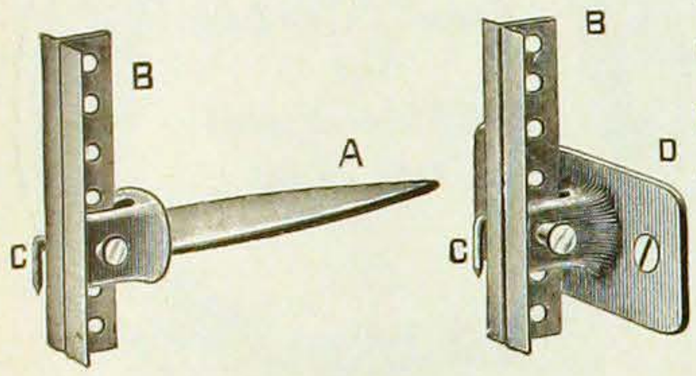
Copper Elbows and Shoes.

ROUND OR SQUARE.

Sizes	2 in.	3 in.	4 in.	5 in.	6 in.
No. 1, per doz.	$7.50	$9.00	$12.00	$15.00	$18.00
No. 2, per doz.	8.00	9.50	12.50	15.50	18.50
No. 3, per doz.	8.50	10.00	13.00	16.00	19.00

Discount.....

Hall's Patent Adjustable Conductor Fasteners.



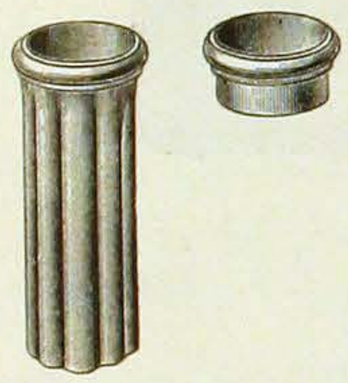
In the first set shown, A is a tinned malleable iron spike to drive in between bricks or stones. B is to be soldered to the conductor. It is made of heavy tin and can be used as shown on square pipe, or easily bent to fit corrugated or plain round pipe. C is a copper nail slipped through A and through B at any desired hole and then clinched down.

In the second set, D is a malleable iron plate to be fastened to a wooden building.

Per set $0.10

Discount.....

Ritchie's Conductor Head.



The cuts show this conductor head first alone, then slipped into the top of a corrugated conductor. It makes a cheap, attractive, and convenient finish, no solder being needed.

Price of each size same as a foot of corrugated pipe.

Discount.....

Adjustable Elbows.

GALVANIZED IRON.

Size	**1¼**	**1½**	**2**	**2½**	**3**	**3½**	**4**	**4½**
Per doz.	$2.40	$2.40	$2.40	$3.00	$3.60	$4.20	$4.80	$5.40

Size	**5**	**5½**	**6**	**7**	**8**	**9**	**10**
Per doz.	$6.60	$7.80	$8.40	$10.20	$13.80	$15.00	$16.80

TIN.

Size	**1¼**	**1½**	**2**	**2½**	**3**	**3½**	**4**	**4½**
Per doz.	$1.80	$1.80	$1.80	$2.40	$2.40	$3.60	$3.60	$4.80

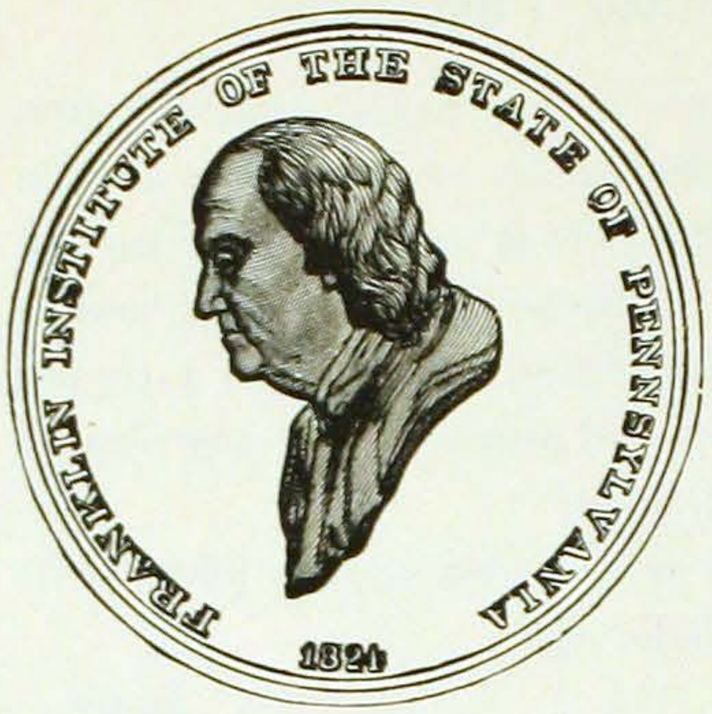
Size	**5**	**5½**	**6**	**7**	**8**	**9**	**10**
Per doz.	$4.80	$6.60	$6.60	$8.40	$10.80	$12.60	$14.40

Discount.....

Galvanized T's & Y's,

Size	**1¼ in.**	**1½ in.**	**2 in.**	**2½ in.**	**3 in.**	**4 in.**	**5 in.**	**5½ in.**	**6 in.**
Each . . .	$0.25	$0.30	$0.35	$0.45	$0.50	$0.65	$0.85	$1.00	$1.10

Discount.....



BRONZE MEDAL

AWARDED BY

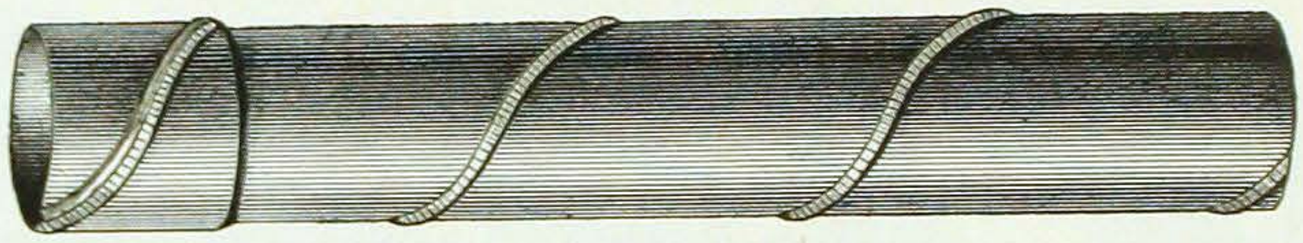
Franklin Institute,

Phila., 1885,

FOR



Ritchie's Patent Spiral Lock-Seam Pipe.



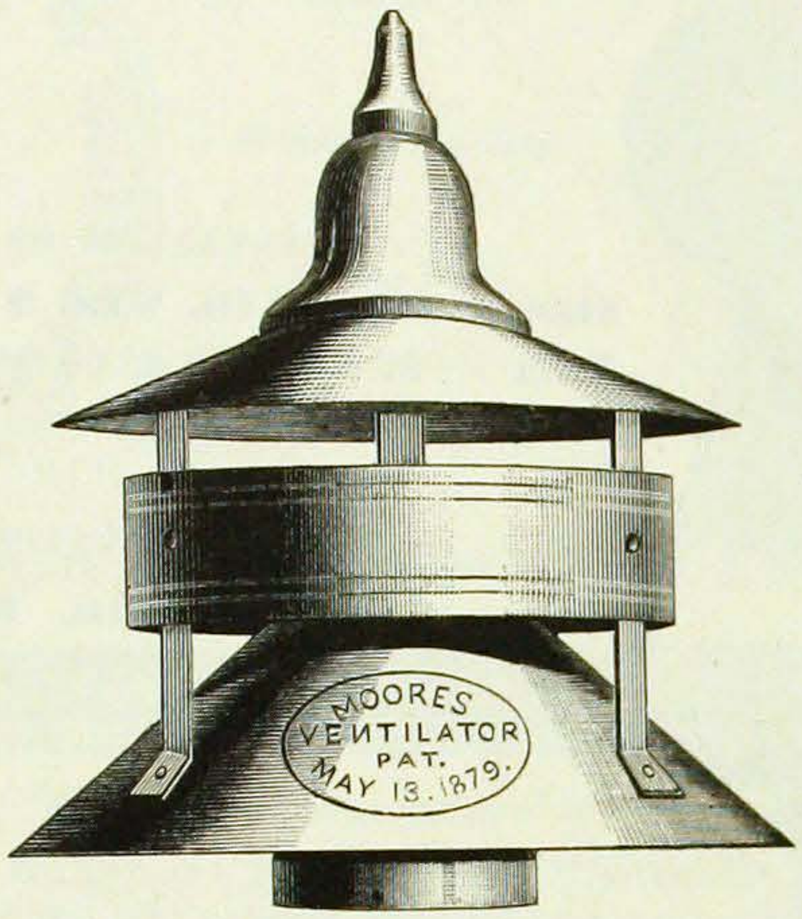
Diameter.	Galvanized. Per foot.	Tin. Per foot.	Brass or Copper. Per foot.
1 inch	$0.08	$0.04	$0.24
1¼ inches	0.11	0.05	0.33
1½ inches	0.12	0.07	0.36
2 inches	0.14	0.09	0.42
2½ inches	0.17	0.10	0.51
3 inches	0.19	0.11	0.57
4 inches	0.25	0.15	0.75
5 inches	0.30	0.21	0.90
5½ inches	0.34	0.25	1.02
6 inches	0.38	0.28	1.14

Discount.....

Notice.—Prices quoted on application for pipe made of other sheet metals.

Moore's Outside Suction Ventilator and Chimney Cap.

PATENTED MAY 13, 1879.



We claim, that the band as placed in this Cap, while it affords thorough protection from storm, does not clog the delivery, as is the case with many others, but tends under pressure to create a vacuum, and thereby accelerate the motion of the air from the Pipe.

Being stationary it is well adapted for use on private dwellings and always presents a neat appearance.

It is made of the best black iron, and then galvanized, thoroughly protecting all edges, rivets, etc. from rust, and zinc soldering all seams thus making it more durable than any cap made of galvanized iron.

We will furnish it to order of any material desired, as copper, brass, kalamein iron, etc. etc.

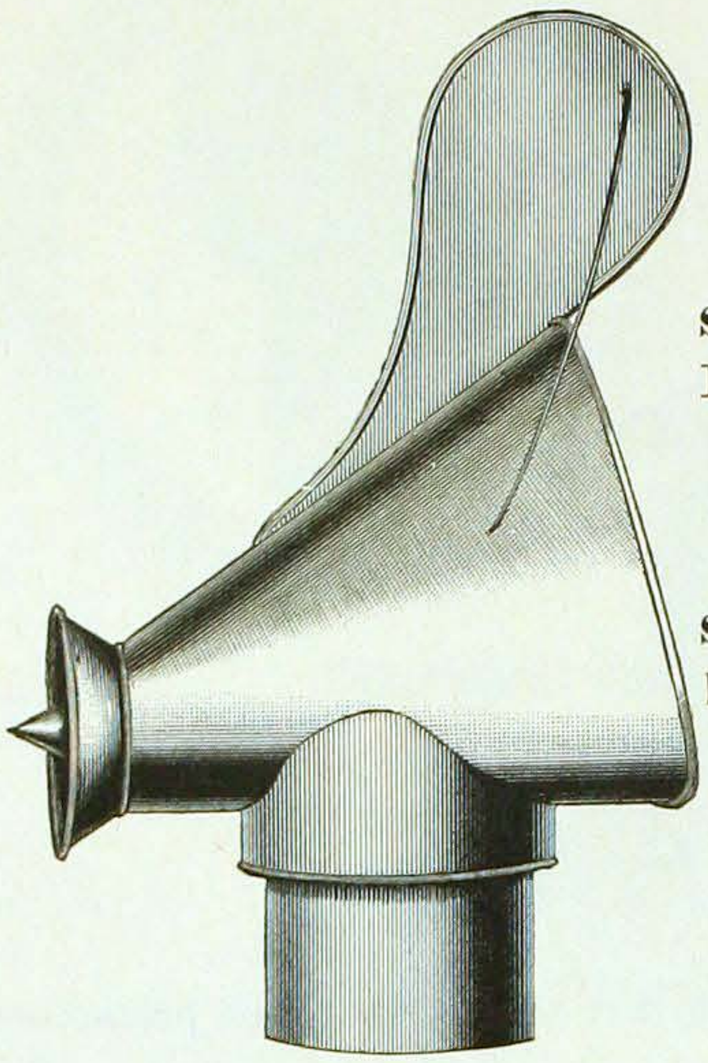
Moore's Galvanized Ventilator.

Diameter	**2 in.**	**2½ in.**	**2¾ in.**	**3 in.**	**3½ in.**	**4 in.**
Each	$1.00	$1.00	$1.00	$1.50	$1.50	$1.75
Diameter	**4½ in.**	**5 in.**	**5½ in.**	**6 in.**	**7 in.**	**8 in.**
Each	$2.00	$2.50	$2.85	$3.40	$4.00	$4.65
Diameter	**9 in.**	**10 in.**	**12 in.**	**14 in.**	**16 in.**	**18 in.**
Each	$5.50	$5.75	$6.75	$13.00	$20.00	$27.00
Diameter	**20 in.**	**24 in.**	**30 in.**	**36 in.**	**40 in.**	**48 in.**	**60 in.**
Each	$33.00	$40.00	$65.00	$90.00	$120.00	$150.00	$225.00

Discount.....per cent.

The Buckeye Revolving Ventilator.

PATENTED.



GALVANIZED OR KALAMEIN.

Size	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.	18 in.
Each	$6.00	$7.00	$8.00	$9.00	$10.00	$12.00	$30.00

Discount.....

COPPER.

Size	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.	18 in.
Each	$10.00	$12.00	$14.00	$16.00	$18.00	$20.00	$50.00

Discount.....

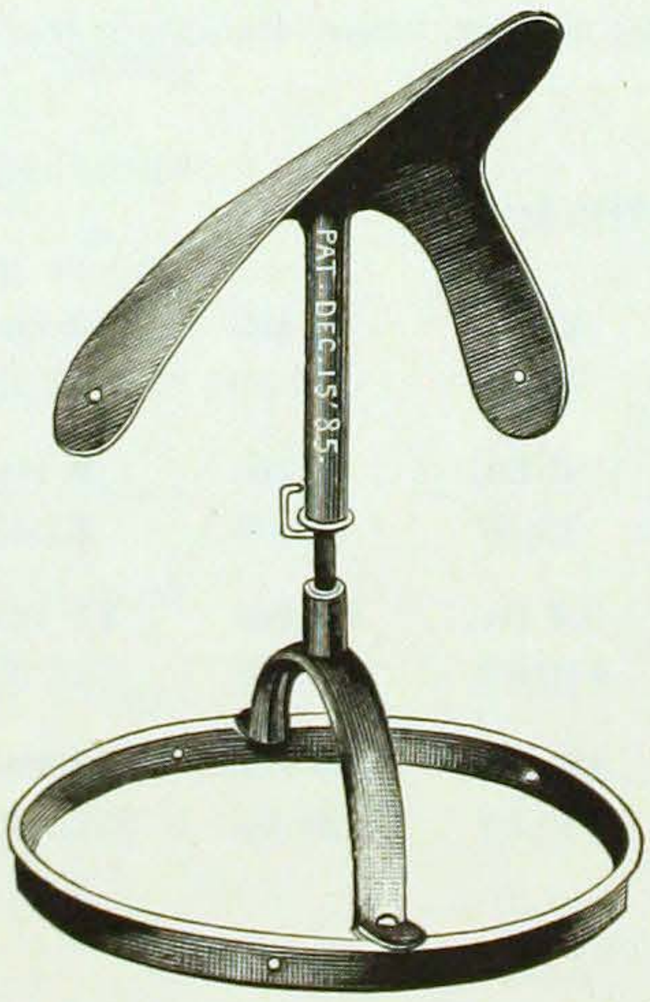
Buckeye Revolving Ventilator.

WITH SPARK CATCHER ATTACHED.

These ventilators are made of No. 18 black iron and japanned, and all seams are riveted. They are particulary adapted to foundry use.

Size	12 in.	18 in.
Each	$30.00	$50.00

Discount.....



Buckeye Ventilator Frame.

Size	6 In.	7 in.	8 in.	9 in.	10 in.	12 in.	18 in.
Each	$0.60	$0.70	$0.80	$0.90	$1.00	$1.25	$3.00 net.



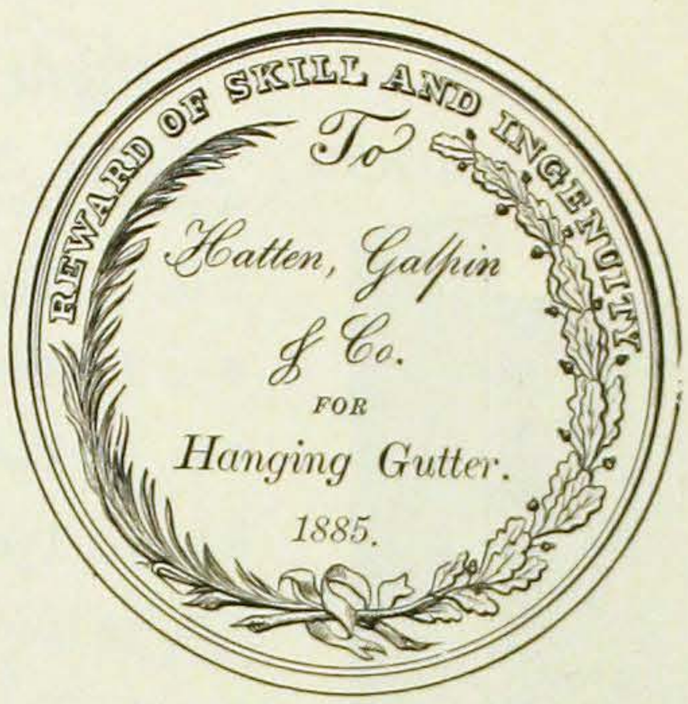
BRONZE MEDAL

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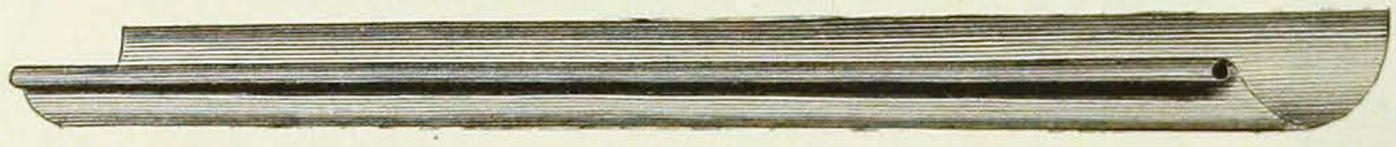
Franklin Institute,

Phila., 1885,

FOR



Hatten, Galpin & Co.'s Eight Foot Eave Trough.



Eight foot seamless hanging eave trough.

Price list of Hatten, Galpin & Co.'s Eight Foot Seamless Hanging Eave Troughs, made of IX terne and bright tin, copper, kalameined, and galvanized iron. Packed in cases of 25 pieces, 200 feet each.

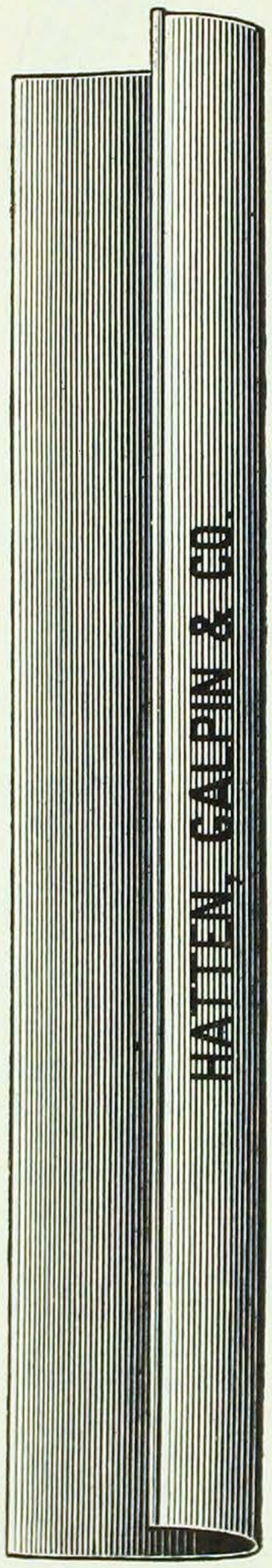
EIGHT FOOT HANGING TROUGHS.

4 inch IX Terne Plate, ½ inch Bead	per foot	$0.08
4½ inch IX Terne Plate, ½ inch Bead	per foot	.09
5 inch IX Terne Plate, ½ inch Bead	per foot	.10
6 inch IX Terne Plate, ½ or ⅝ inch Bead	per foot	.11½
7 inch IX Terne Plate, ⅝ inch Bead	per foot	.13
8 inch IX Terne Plate, ⅝ inch Bead	per foot	.14
4 inch IX Bright Plate, ½ inch Bead	per foot	.9½
4½ inch IX Bright Plate, ½ inch Bead	per foot	.10½
5 inch IX Bright Plate, ½ inch Bead	per foot	.12
6 inch IX Bright Plate, ½ or ⅝ inch Bead	per foot	.13½
7 inch IX Bright Plate, ⅝ inch Bead	per foot	.15
8 inch IX Bright Plate, ⅝ inch Bead	per foot	.16½
4 inch Light Kalamein Iron, ½ inch Bead	per foot	.11½
5 inch Light Kalamein Iron, ½ inch Bead	per foot	.12½
6 inch Light Kalamein Iron, ⅝ inch Bead	per foot	.14
7 inch Light Kalamein Iron, ⅝ inch Bead	per foot	.15½
8 inch Light Kalamein Iron, ⅝ inch Bead	per foot	.17
4 inch No. 28 Kalamein and Galvanized, ½ inch Bead	per foot	.13½
5 inch No. 28 Kalamein and Galvanized, ½ inch Bead	per foot	.15½
6 inch No. 28 Kalamein and Galvanized, ⅝ inch Bead	per foot	.17
7 inch No. 28 Kalamein and Galvanized, ⅝ inch Bead	per foot	.18½
8 inch No. 28 Kalamein and Galvanized, ⅝ inch Bead	per foot	.20
4 inch, 16 oz. Brazier's Copper, ½ inch Bead	per foot	.18
5 inch, 16 oz. Brazier's Copper, ½ inch Bead	per foot	.22
6 inch, 16 oz. Brazier's Copper, ⅝ inch Bead	per foot	.25
7 inch, 16 oz. Brazier's Copper, ⅝ inch Bead	per foot	.27
8 inch, 16 oz. Brazier's Copper, ⅝ inch Bead	per foot	.28

DISCOUNTS.

Terne and Bright Tin	per cent.	Galvanized Iron	per cent.
Kalameined Iron	per cent.	Copper	——per cent.

Cases for troughs, $0.25.



Eight foot seamless wide roof gutters.

Eight Foot Wide Roof Gutters.

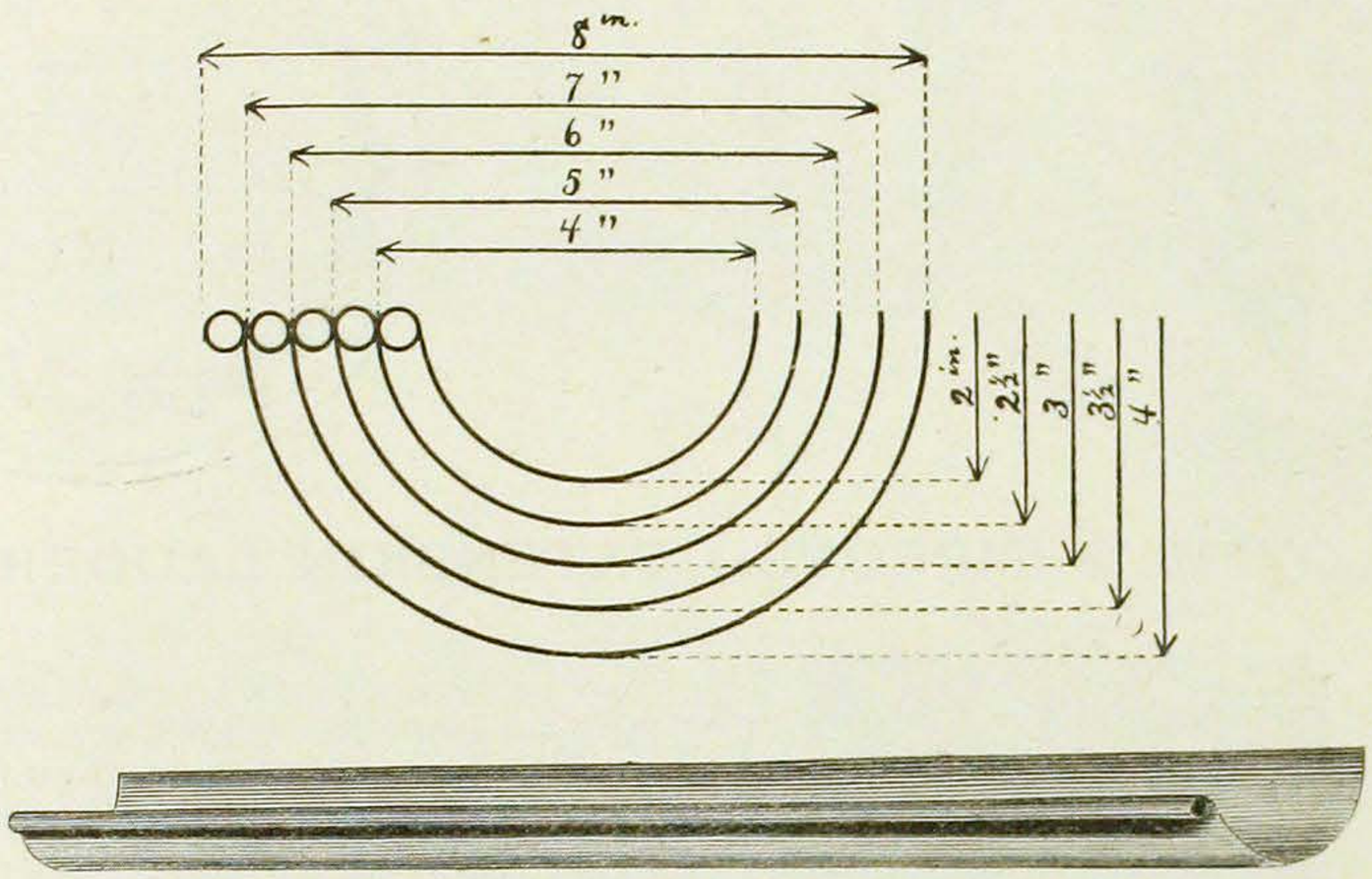
4 in. IX Terne Plate, 14 in. Sheet, ½ in. Bead	.	per ft.	$0.15½
5 in. IX Terne Plate, 14 in. Sheet, ½ in. Bead	.	per ft.	.15½
6 in. IX Terne Plate, 20 in. Sheet, ⅝ in. Bead	.	per ft.	.22
7 in. IX Terne Plate, 20 in. Sheet, ⅝ in. Bead	.	per ft.	.22
8 in. IX Terne Plate, 20 in. Sheet, ⅝ in. Bead	.	per ft.	.22
7 in. IX Terne Plate, 28 in. Sheet, ⅝ in. Bead	.	per ft.	.30
8 in. IX Terne Plate, 28 in. Sheet, ⅝ in. Bead	.	per ft.	.30
9 in. IX Terne Plate, 28 in. Sheet, ⅝ in. Bead	.	per ft.	.30
10 in. IX Terne Plate, 28 in. Sheet, ⅝ in. Bead	.	per ft.	.30
4 in. IX Bright Plate, 14 in. Sheet, ½ in. Bead	.	per ft.	.18
5 in. IX Bright Plate, 14 in. Sheet, ½ in. Bead	.	per ft.	.18
6 in. IX Bright Plate, 20 in. Sheet, ⅝ in. Bead	.	per ft.	26
7 in. IX Bright Plate, 20 in. Sheet, ⅝ in. Bead	.	per ft.	.26
8 in. IX Bright Plate, 20 in. Sheet, ⅝ in. Bead	.	per ft.	.26
7 in. IX Bright Plate, 28 in. Sheet, ⅝ in. Bead	.	per ft.	.34
8 in. IX Bright Plate, 28 in. Sheet, ⅝ in. Bead	.	per ft.	.34
9 in. IX Bright Plate, 28 in. Sheet, ⅝ in. Bead	.	per ft.	.34
10 in. IX Bright Plate, 28 in. Sheet, ⅝ in. Bead	.	per ft.	.34
4 in., 16 oz. Brazier's Copper, 14 in. Sheet, ½ in. Bead,		per ft.	.30
5 in., 16 oz. Brazier's Copper, 14 in. Sheet, ½ in. Bead,		per ft.	.30
6 in., 16 oz. Brazier's Copper, 14 in. Sheet, ⅝ in. Bead,		per ft.	.30
7 in., 16 oz. Brazier's Copper, 20 in. Sheet, ⅝ in. Bead,		per ft.	.40
8 in., 16 oz. Brazier's Copper, 20 in. Sheet, ⅝ in Bead,		per ft.	.40
9 in., 16 oz. Brazier's Copper, 24 in. Sheet, ⅝ in. Bead,		per ft.	.50
10 in., 16 oz. Brazier's Copper, 24 in. Sheet, ⅝ in. Bead,		per ft.	.50

Discounts, { Terne and Bright Tin.....per cent.
Kalameined Iron..... per cent.
Galvanized Iron.....per cent.
Copper.....per cent.

Cases for gutters, $0.50.

HATTEN, GALPIN & CO.'S

FIVE FOOT SEAMLESS HANGING EAVE TROUGHS.



Made of Prime IC Leaded and Bright Tin Plate.

4 inch IC Terne Plate, ⅜ inch round bead, per foot	$0.06¾
4½ inch IC Terne Plate, ⅜ inch round bead, per foot	.07
5 inch IC Terne Plate, ½ inch round bead, per foot	.07¼
5½ inch IC Terne Plate, ½ inch round bead, per foot	.07¾
6 inch IC Terne Plate, ½ inch round bead, per foot	.08½
4 inch IC Bright Plate, ⅜ inch round bead, per foot	.08
4½ inch IC Bright Plate, ⅜ inch round bead, per foot	.08¼
5 inch IC Bright Plate, ½ inch round bead, per foot	.08½
5½ inch IC Bright Plate, ½ inch round bead, per foot	.09
6 inch IC Bright Plate, ½ inch round bead, per foot	.09¾

Packed in cases of (50 pieces), 250 feet each.

Discount.....

Cases . . . . . each $0.25



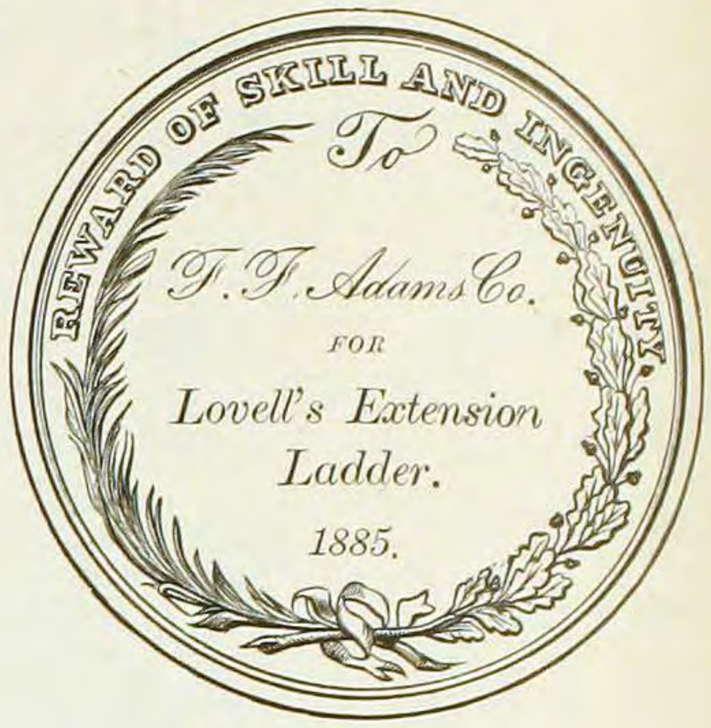
BRONZE MEDAL

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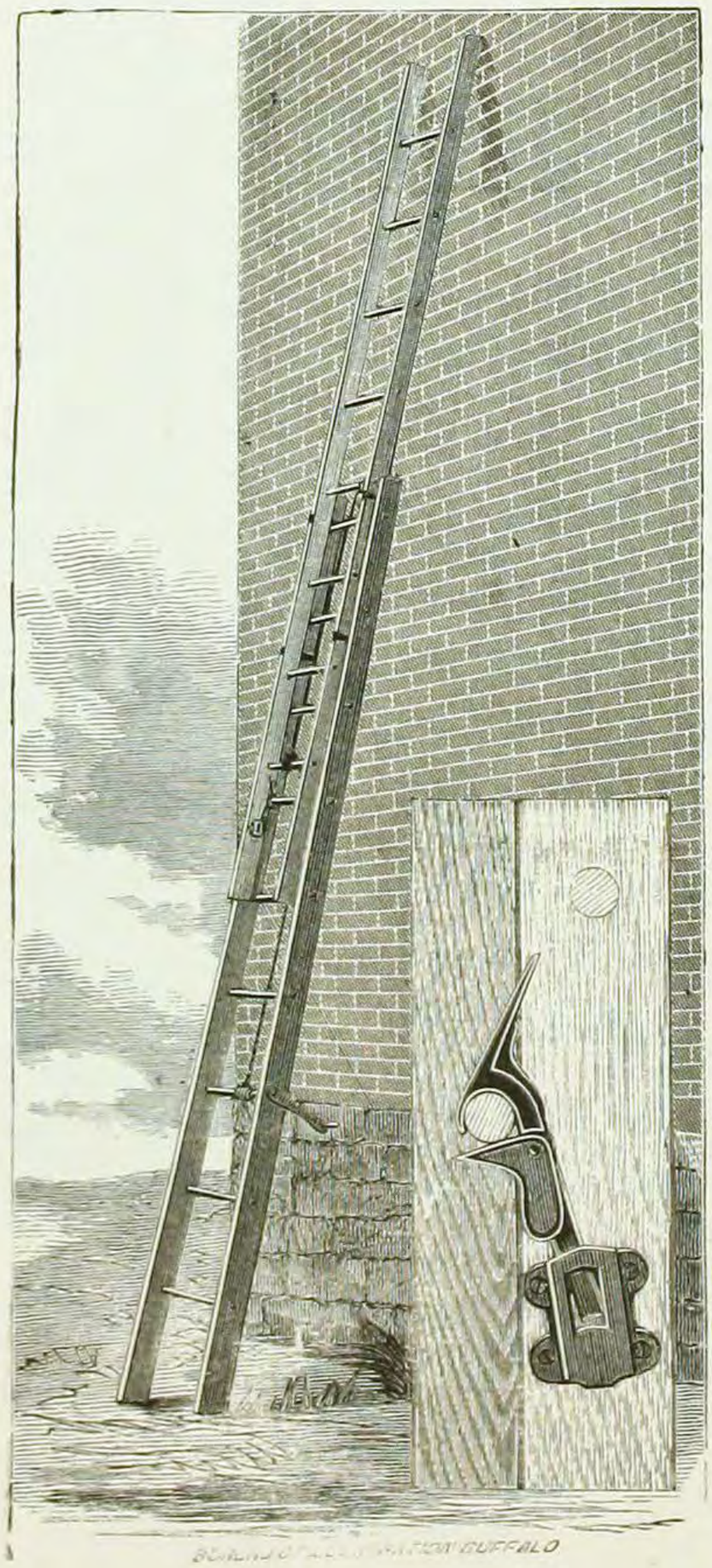
Franklin Institute,

Phila., 1885.

FOR



LOVELL'S IMPROVED EXTENSION LADDER.



This ladder is a model of simplicity, convenience lightness and strength, and is designed to meet a want long felt by painters, tinners, fruit growers, and others requiring a long, and at the same time, light ladder or ladders for various lengths. There should be one at every country residence to be used in case of fire. It can be varied to any length between its whole and half length by turning a crank, and is held to any length by its automatic fastenings. [An enlarged view of one of the fastenings is shown in the accompanying engraving.] They are attached to the lower end of the sliding section, and fasten or unfasten themselves at the will of the operator, when the crank is turned, not requiring anything of the rope except to raise and lower the sliding section, nor depending on any springs, which are always liable to get out of order, or upon the weight of the sliding section, as is the case with some, which makes large ladders operate very hard.

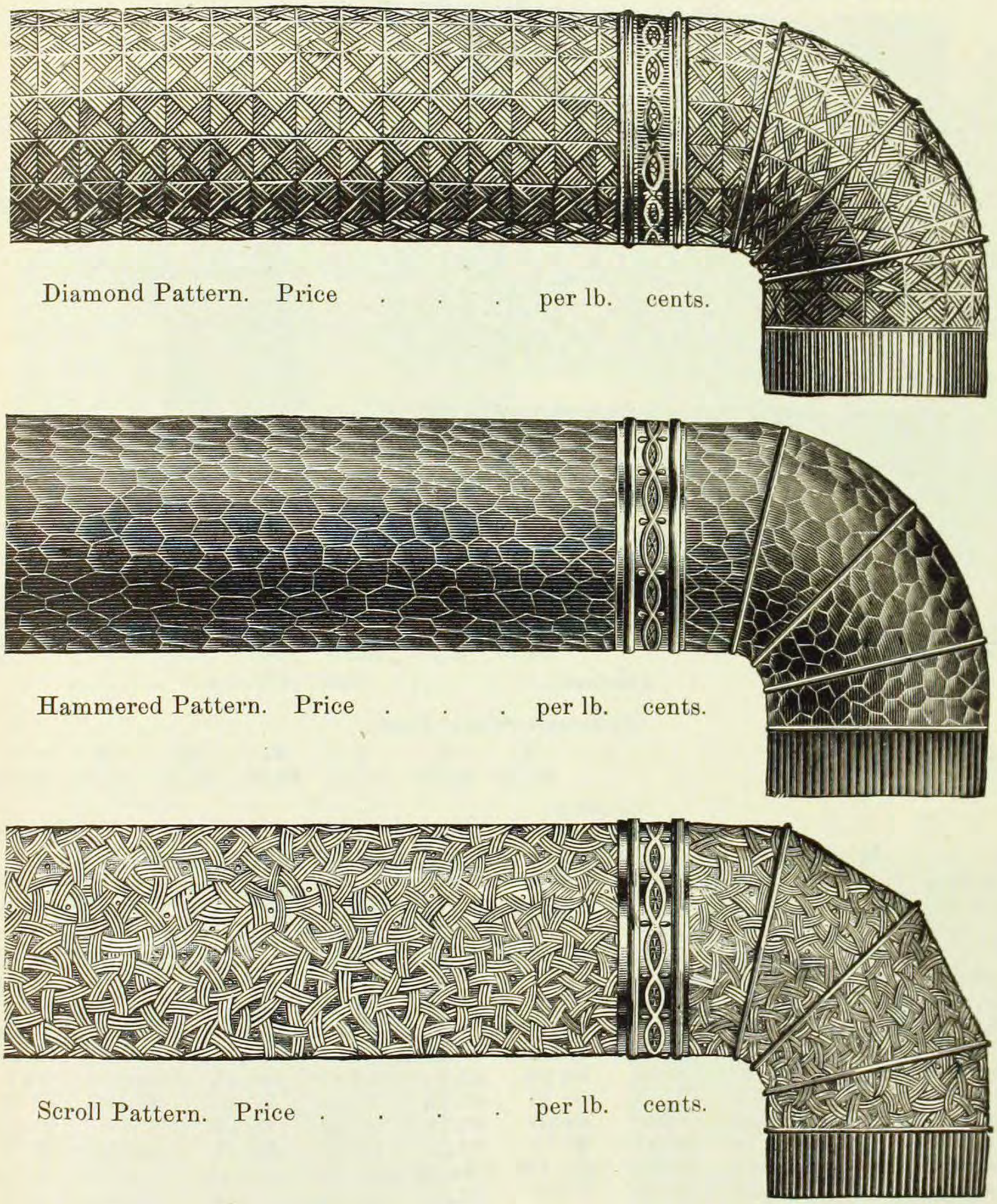
In some extension ladders the sliding section is extended to the length required before setting them up, thus making them as hard to set up as a common ladder. In others they are set up before being extended, and the top is allowed to rest against the object against which it is being used, then the sliding section is extended by pushing it up by hand, and following on the lower section until the height required is attained, making it a tiresome and dangerous operation, besides badly marring or scratching the object against which it is being set up. It will be readily seen that all the above objections are entirely overcome in this ladder. All sizes operating with perfect ease, there is absolutely nothing about it to get out of order.

They are made from the best materials, and in a manner that cannot fail to give the best satisfaction.

Length of section.	Length extended.	Each.
10 feet.	17 feet.	$6.00
12 feet.	21 feet.	7.25
14 feet.	25 feet.	8.50
16 feet.	29 feet.	9.75
18 feet.	33 feet.	13.00
20 feet.	37 feet.	14.00

Discount.....

EMBOSSED SHEET IRON—DOUBLE ANNEALED.



Diamond Pattern. Price . . . per lb. cents.

Hammered Pattern. Price . . . per lb. cents.

Scroll Pattern. Price . . . . per lb. cents.

This new and beautiful iron is made of the best quality and is cold rolled and entirely free from scale and will readily double seam without breaking.

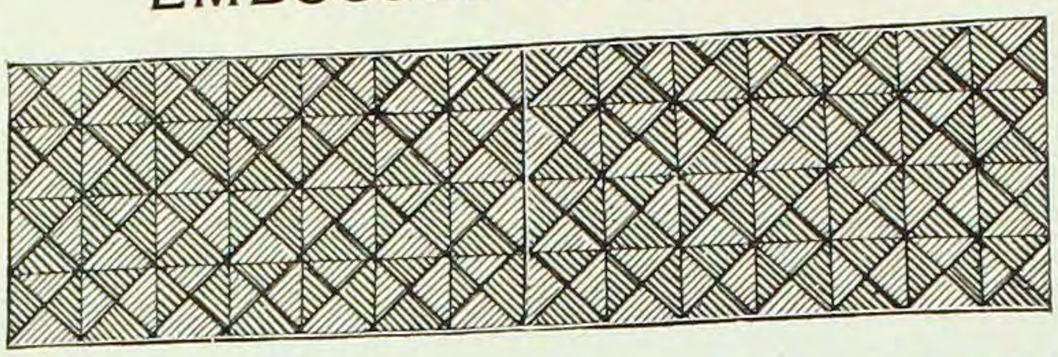
The appearance of this iron when polished is superior to that of Russia and costs considerably less. It is especially adapted for Stove Pipe, Stove Bodies, Coal Hods, and Blowers, and we are prepared to furnish special sizes.

Embossed Stove Pipe and Elbows when used in connection with ornamental stoves produce a particularly handsome effect and have only to be seen to be appreciated. The Nickel-plated Bands (as shown in the above cuts) are used to cover the lap, and they add considerably to the general appearance.

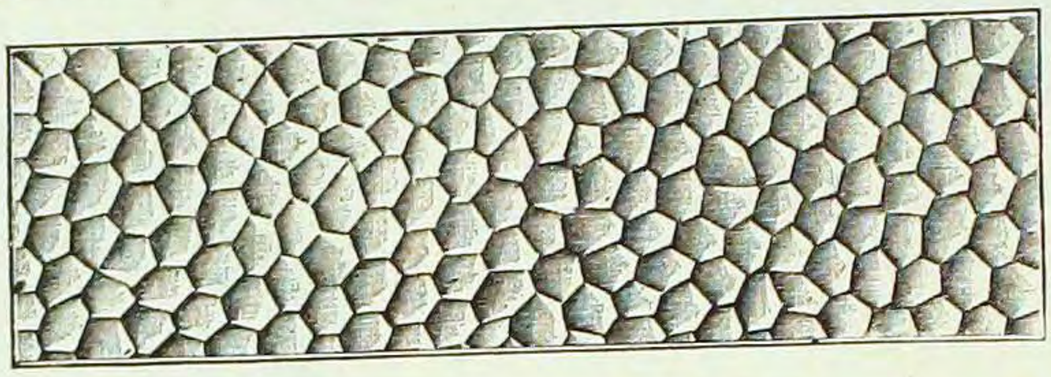
Embossed Tin 14 x 20 and 20 x 28 kept in stock. Special sizes furnished to order.

EMBOSSED STOVE PIPE AND ELBOWS.

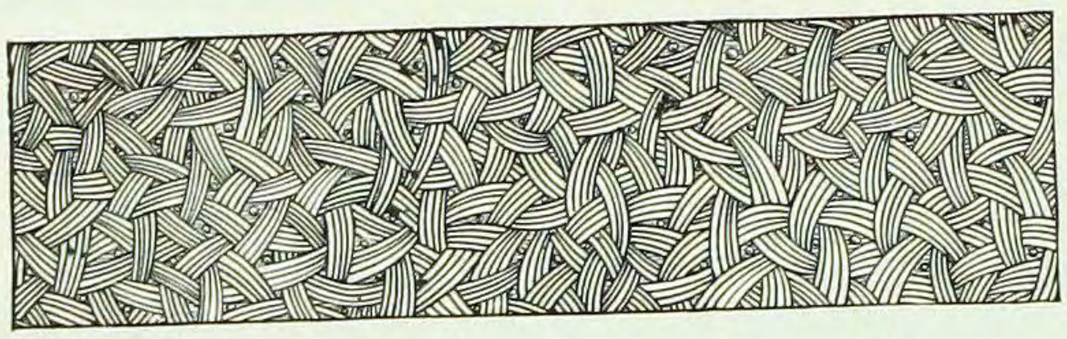
Diamond Pattern.

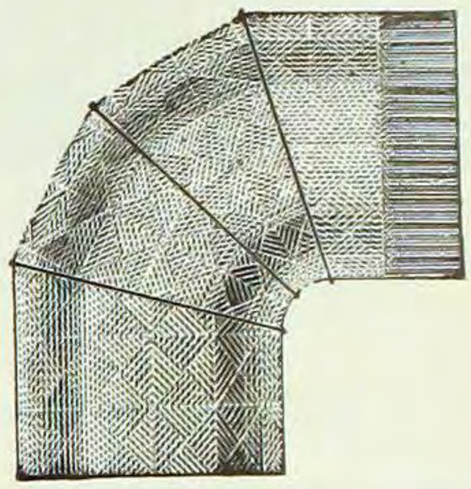


Hammered Pattern.



Scroll Pattern.





Embossed Elbows.

Inches	4	4½	5	5½	5¾	6	7
Per dozen	$2.15	$2.35	$2.50	$2.60	$2.70	$2.80	$3.25

Discount.....

Embossed Stove Pipe.

Inches	4	4½	5	5½	5¾	6	7
Per joint	$0.19	$0.20	$0.21	$0.22	$0.23	$0.23	$0.25

Discount.....

Nickel-Plated Bands for Embossed Stove Pipe.

Inches	4	4½	5	5½	5¾	6	7
Per doz.	$1.25	$1.25	$1.30	$1.35	$1.40	$1.40	$1.50

Slate Register Stones.

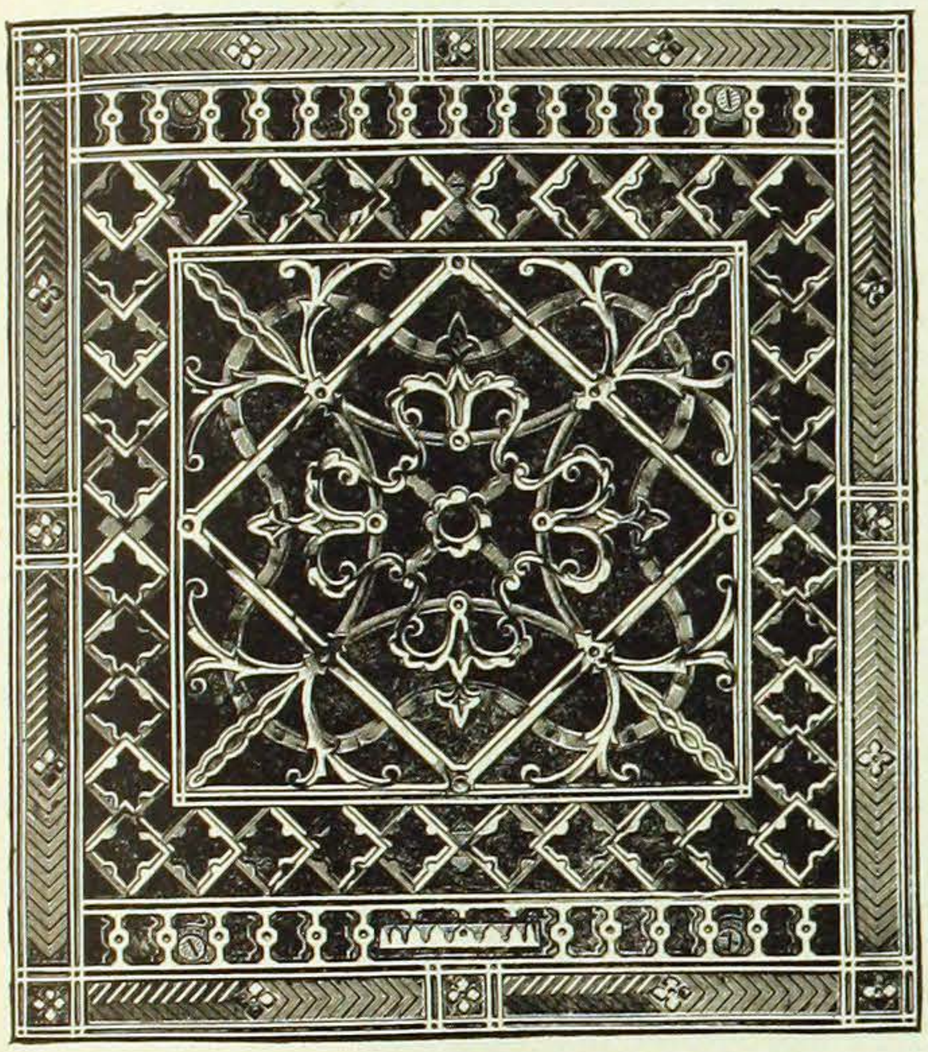
Inches	6	7	8	9	10	12	14	16
Price	$1.20	$1.50	$1.75	2.00	$2.30	$2.75	$3.50	$4.50
Inches	**18**	**20**	**24**	**4x8**	**4x10**	**4x13**	**4x15**	**4x18**
Price	$5.75	$7.50	$12.00	$1.20	$1.40	$1.60	$1.90	$2.20
Inches	**6x8**	**6x9**	**6x10**	**6x14**	**6x16**	**6x18**	**6x24**	**7x7**
Price	$1.75	$1.85	$1.95	$2.25	$2.60	$2.90	$3.50	$1.80
Inches	**7x10**	**8x8**	**8x10**	**8x12**	**8x15**	**8x18**	**9x9**	**9x12**
Price	$2.00	$1.90	$2.10	$2.30	$2.80	$3.00	$2.25	$2.60
Inches	**9x13**	**9x14**	**10x10**	**10x12**	**10x14**	**10x16**	**11x17**	**12x12**
Price	$2.75	$2.90	$2.80	$2.90	$3.15	$3.50	$3.80	$3.10
Inches	**12x15**	**12x16**	**12x17**	**12x19**	**12x20**	**12x24**	**14x14**	**14x18**
Price	$3.75	$3.90	$4.20	$4.70	$5.00	$5.75	$4.75	$5.50
Inches	**14x20**	**14x22**	**15x25**	**16x16**	**16x20**	**16x24**	**20x20**	**20x24**
Price	$5.90	$6.25	$9.00	$6.00	$8.50	$9.50	$10.00	$11.00
Inches			**20x26**	**21x27**	**21x29**	**27x27**	**27x38**	**30x30**
Price			$11.50	$12.50	$14.00	$16.50	$20.00	$18.00

Special sizes made to order.

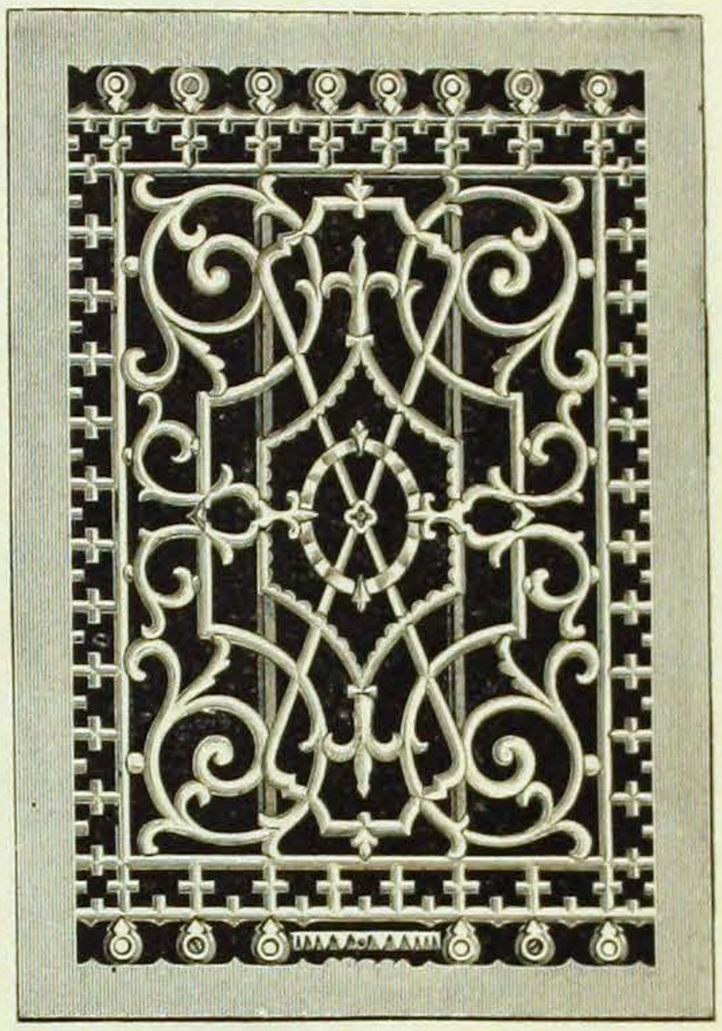
Discount.....

Marbleized register facings furnished to order.

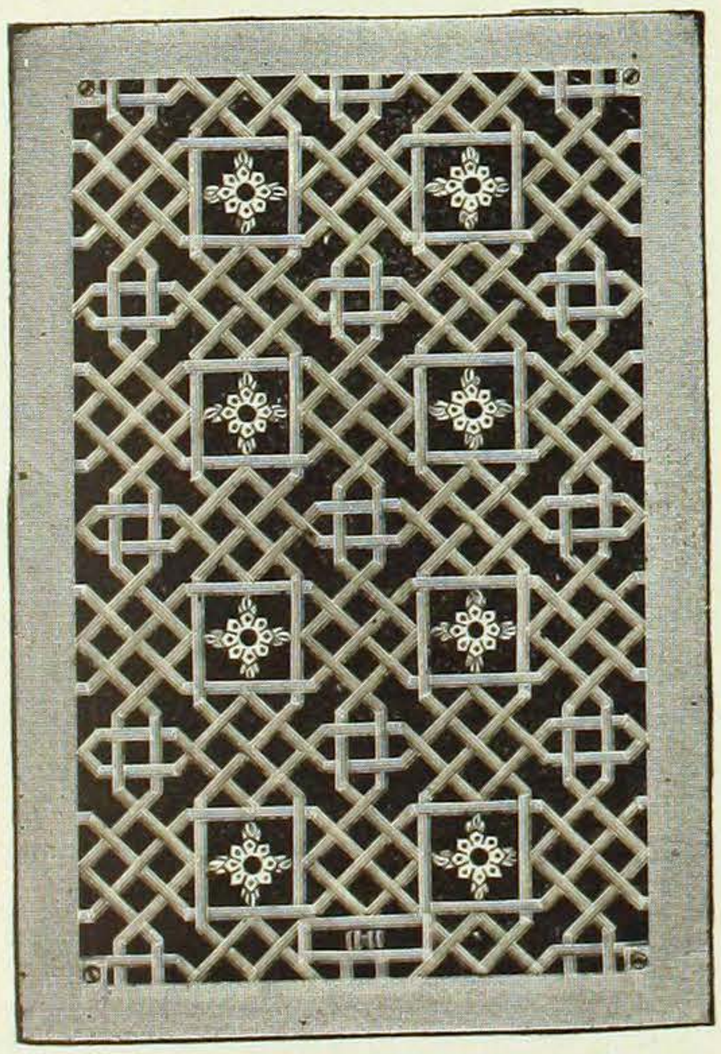
TUTTLE & BAILEY'S REGISTERS.



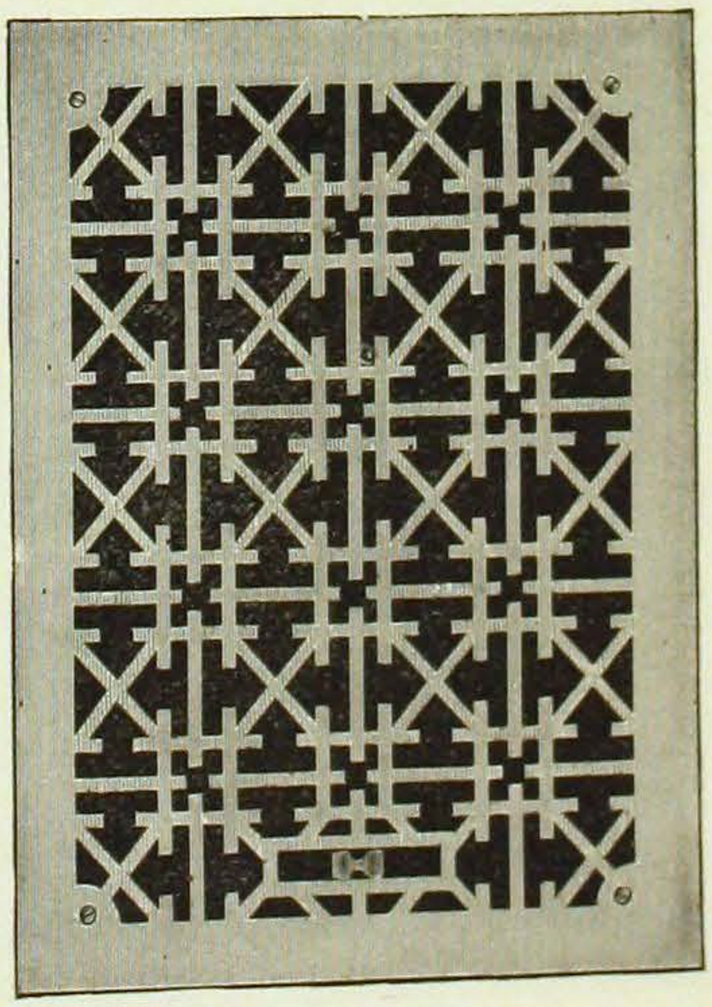
FLORENTINE.



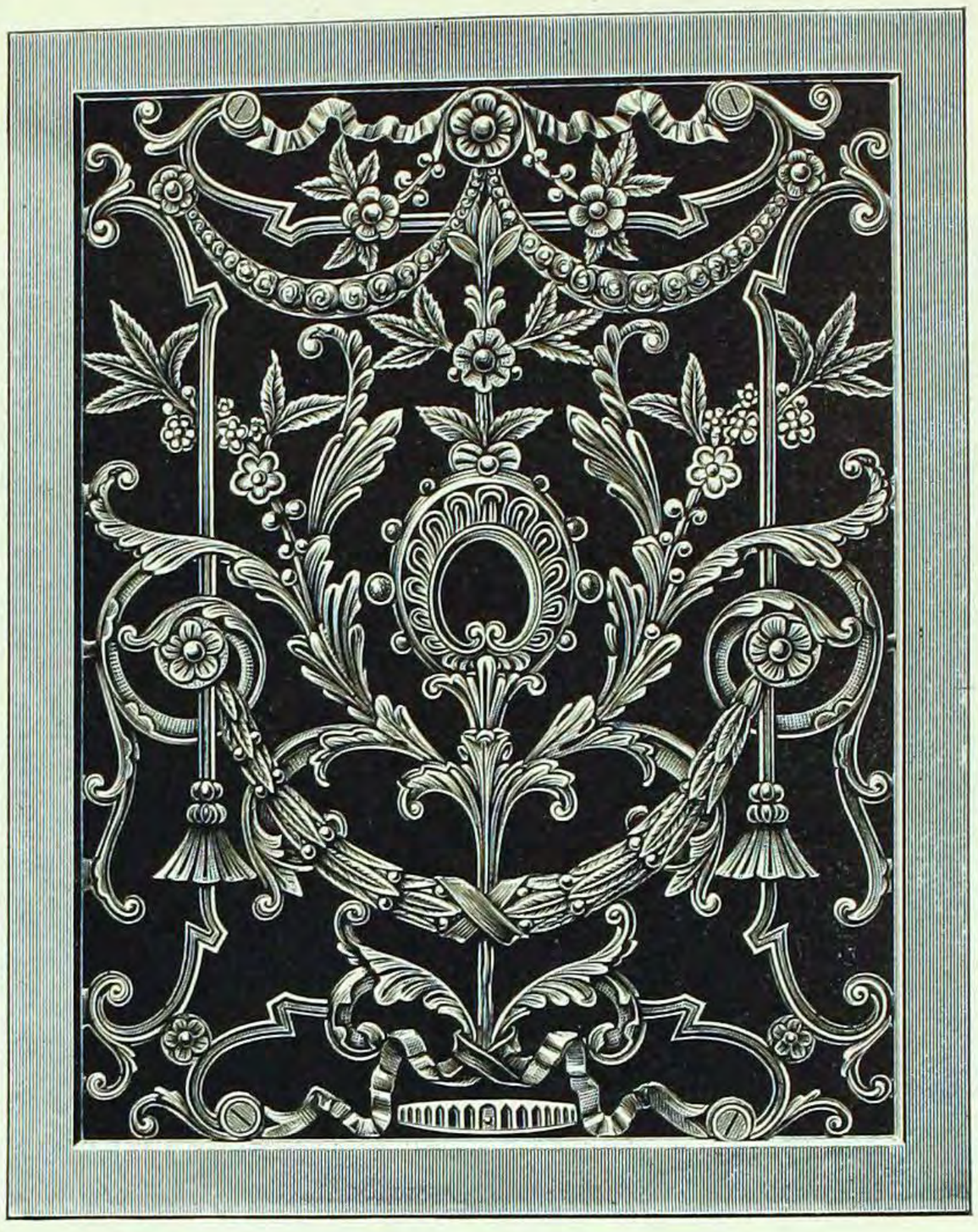
BRILLIANT.



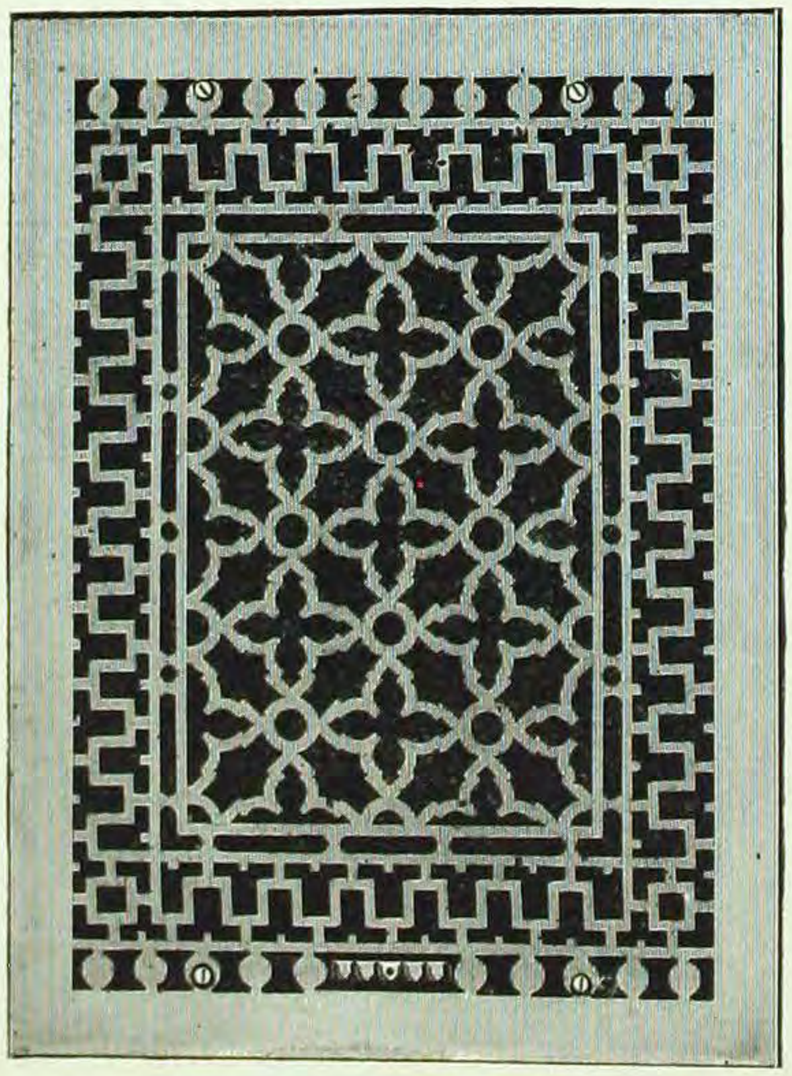
MORESQUE.



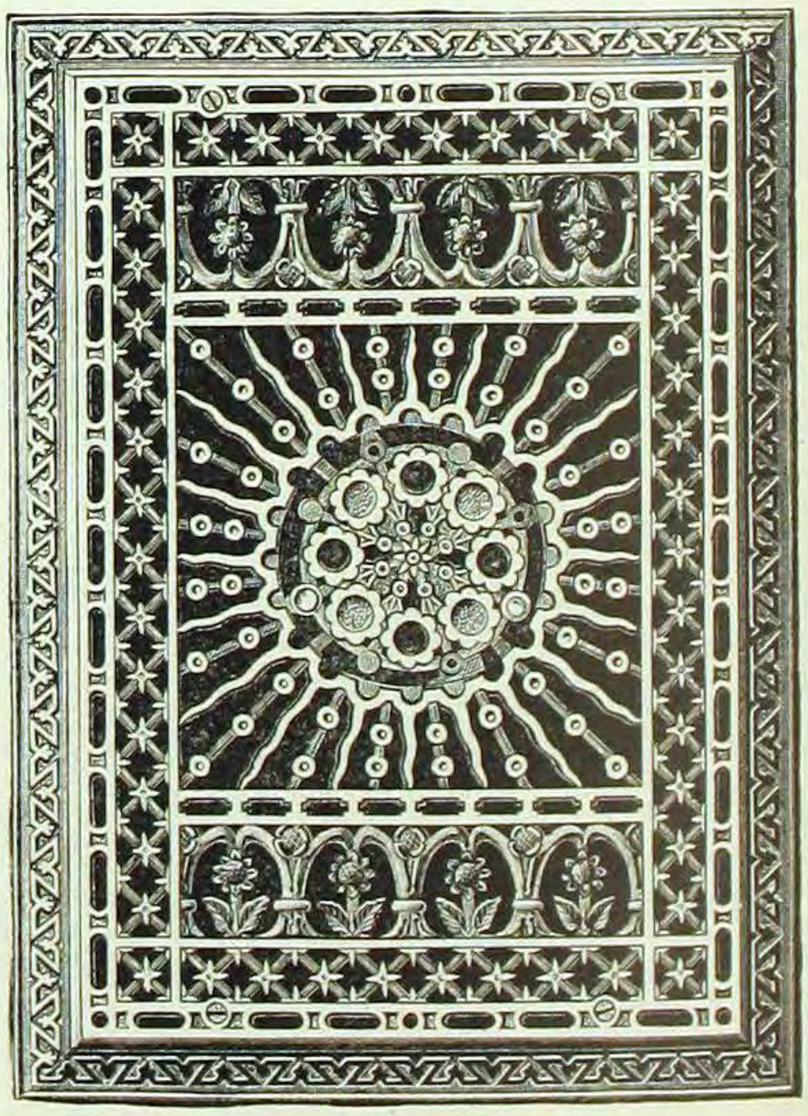
JAPANESE.



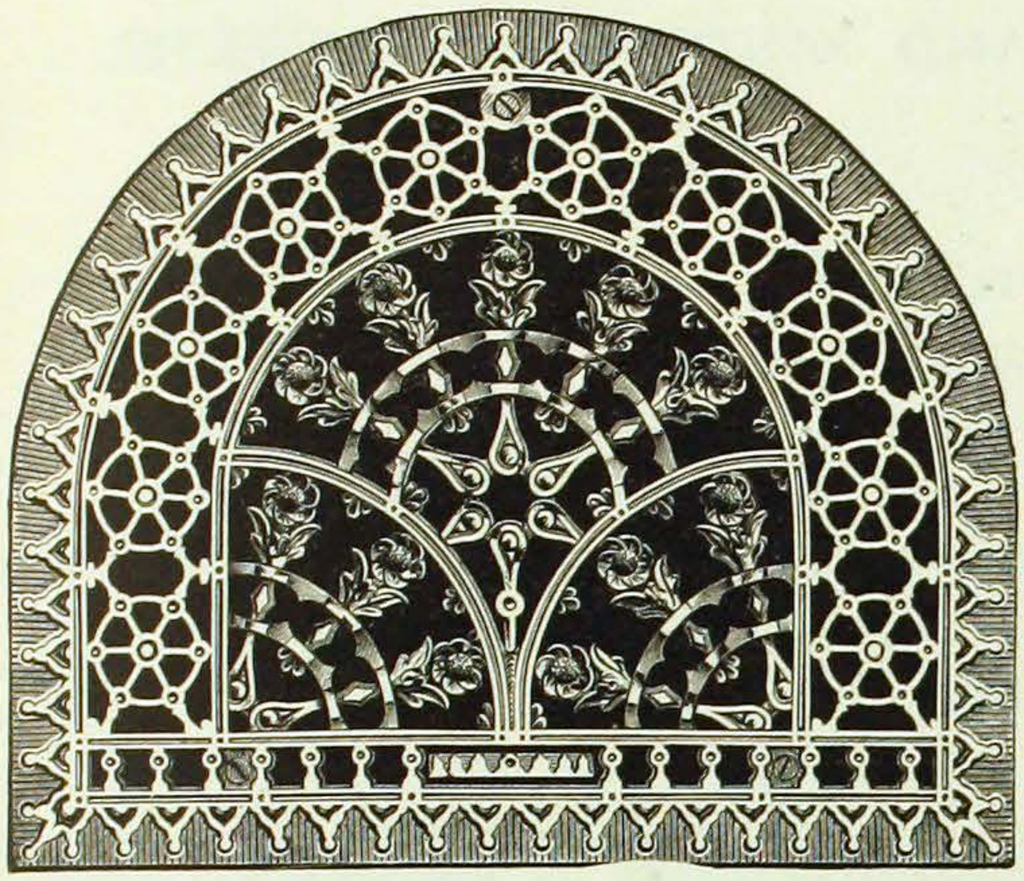
RENAISSANCE.



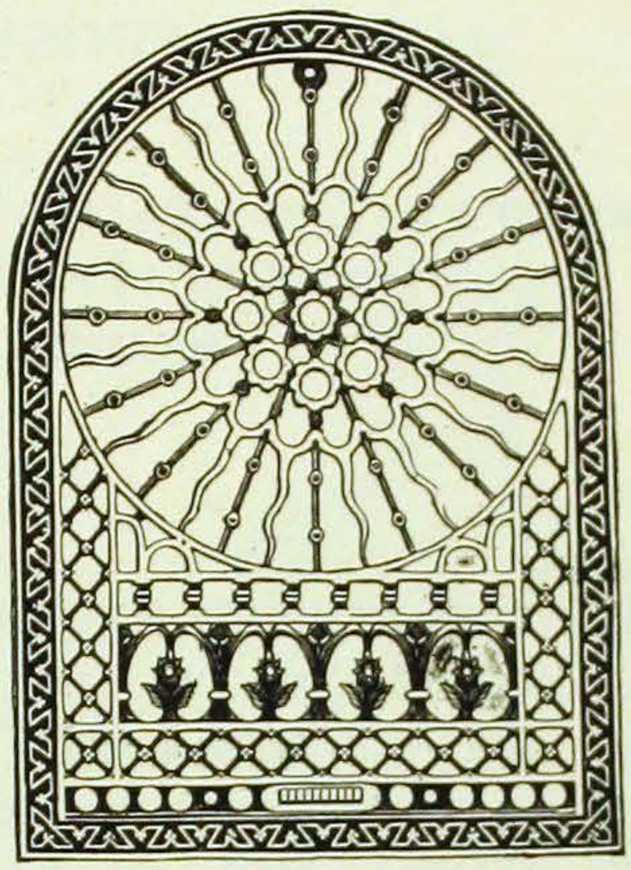
PERSIAN.



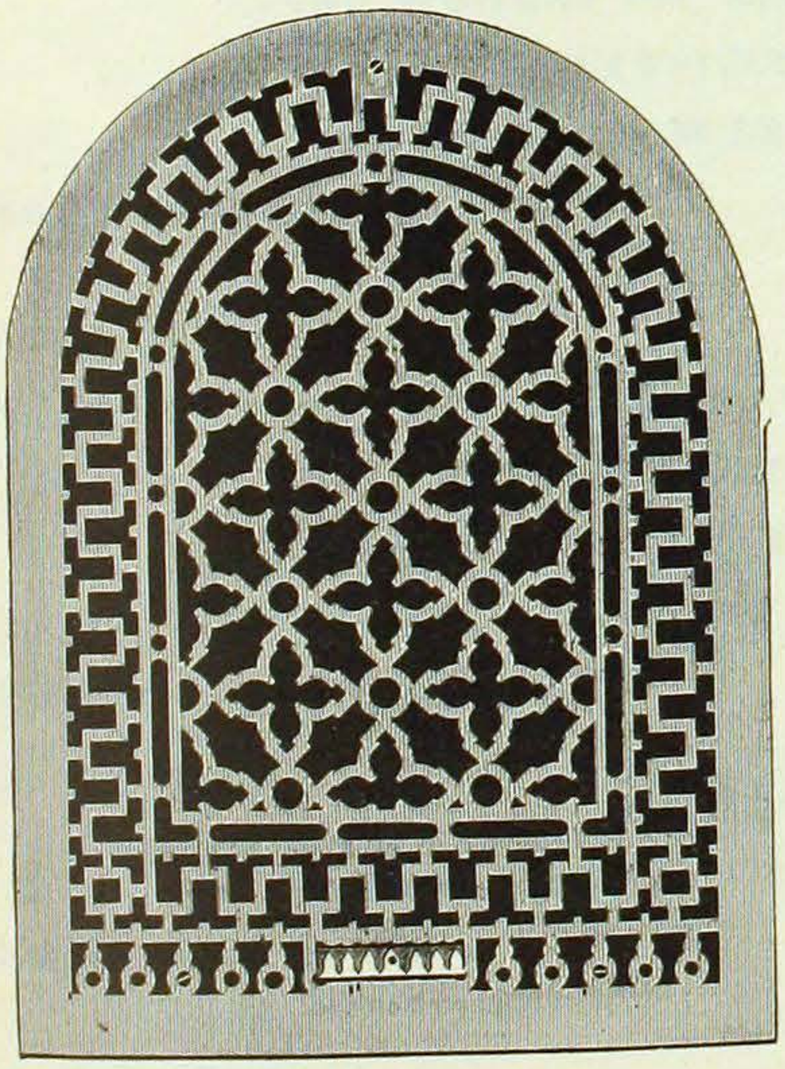
FLAMBOYANT.



FLORENTINE.



FLAMBOYANT.



PERSIAN.



DAISY.

Price List and Discounts furnished on application.

LIST OF

VARIOUS FINISHES AND KINDS OF REGISTERS.

GOLD PLATED REGISTERS.
SILVER PLATED REGISTERS.
OXIDIZED REGISTERS.
SOLID BRONZE REGISTERS.
SOLID BRASS REGISTERS.
STATUARY BRONZE REGISTERS.
COPPER PLATED REGISTERS.
BRASS PLATED REGISTERS.
BRONZE PLATED REGISTERS.
NICKEL PLATED REGISTERS.
WHITE ENAMELED REGISTERS.
GOLD BRONZED REGISTERS.
COPPER BRONZED REGISTERS.
SILVER BRONZED REGISTERS.
BLACK JAPANNED REGISTERS.
WHITE JAPANNED REGISTERS.
CONVEX REGISTERS (for shallow flues.)
HINGED REGISTERS.
ASYLUM REGISTERS.
PEDESTAL REGISTERS.
SMOKE PIPE REGISTERS.
ORNAMENTAL SCREENS.
SELF INDICATING VENTILATORS.
CEILING VENTILATORS.
CHANDELIER VENTILATORS.
ICE HOUSE VENTILATORS.
WINDOW VENTILATORS.
NARROW FACE PLATES.
BARKER REGISTERS.
SQUARE DAMPERS.
OVAL DAMPERS.

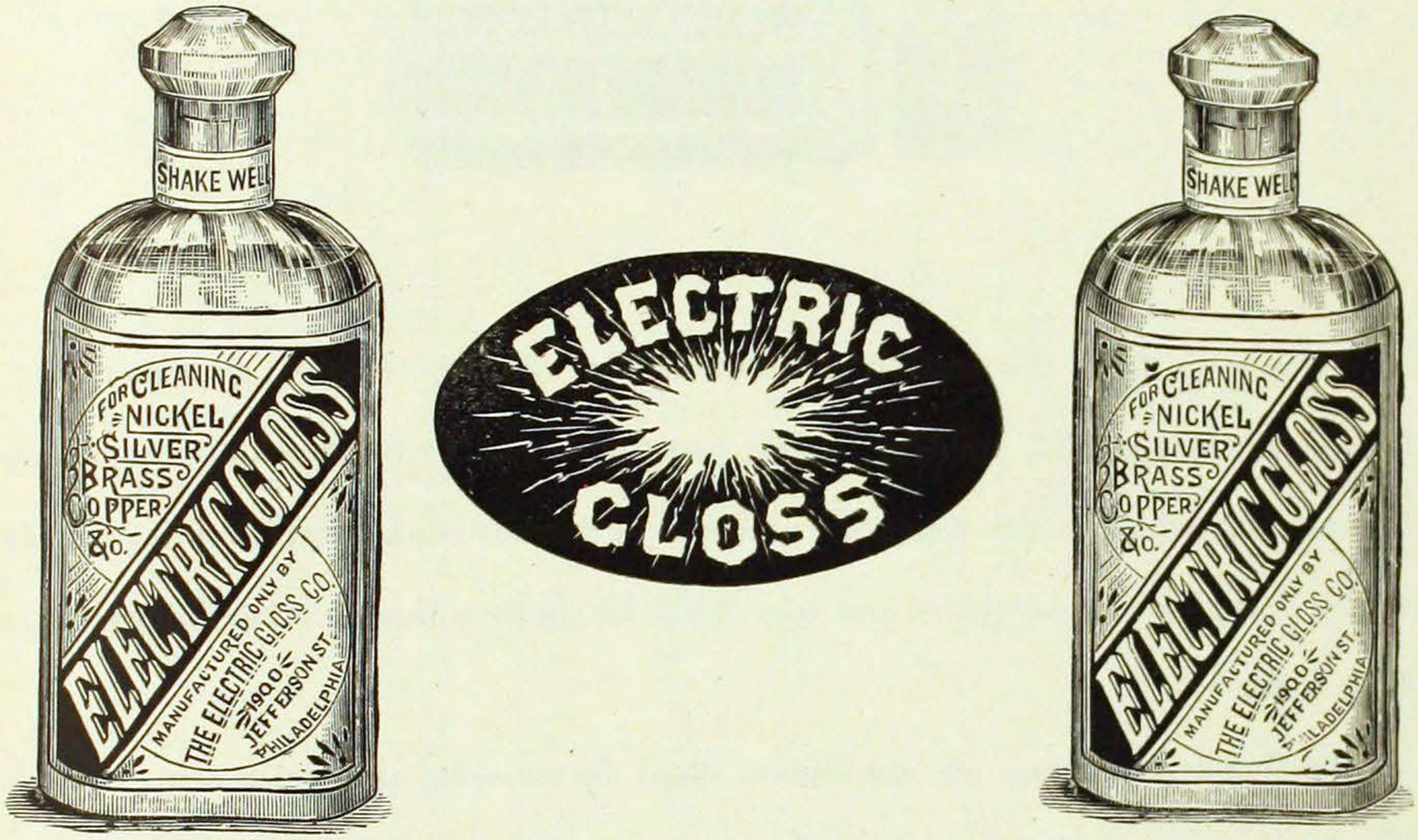
We keep for the accommodation of the trade a full and complete display of the latest designs and finishes.

A large stock of Registers constantly on hand.

ELECTRIC GLOSS.

FOR CLEANING GOLD, SILVER, NICKEL, GLASS, AND PLATED WARE.

Sure. Clean. Permanent.



Will polish quicker and retain a brighter gloss than any preparation in the market. Will not injure the finest burnished surface. Entirely free from grit or acids. Directions for using on each bottle.

Per doz. . . . . $1.50 net.

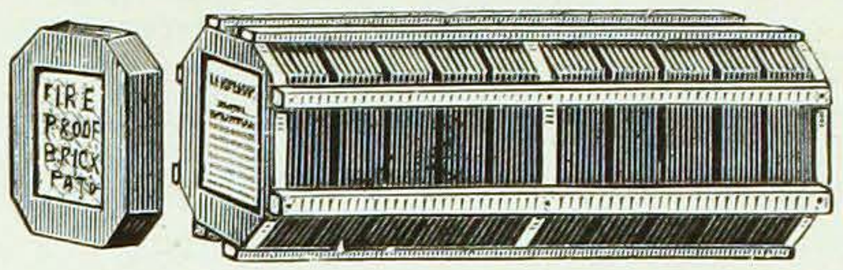
Excelsior Soldering Fluid.

A superior flux for use in soldering tin, lead, zinc, galvanized iron, iron, brass, copper, and all metals. It is not corrosive, and will not injure the hands or nose of the workman. It is always ready for use, and is undoubtedly the very best soldering solution in the market, being especially adapted to tinners, plumbers, galvanized iron and zinc workers, can makers, packers, coppersmiths, and other metal workers' use.

One Quart Bottle	$0.35
One Case (Twelve Bottles)	3.50
Per Gallon, in Cans	.50
Per Gallon, in Carboys	.40
Per Gallon, in Barrels or Half Barrels	.40

Cans, carboys, barrels, and half barrels charged at cost.

PATENT PLASTIC LINING.



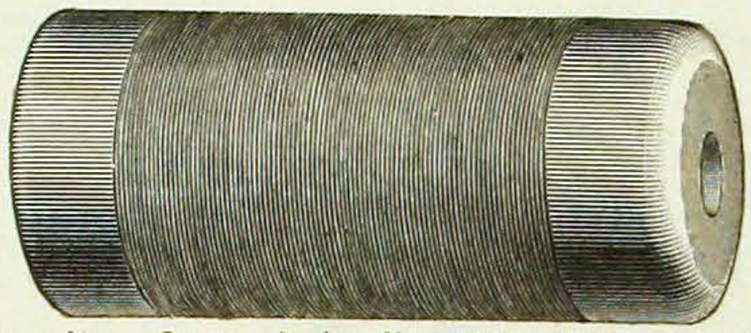
It is made from five entirely different articles (fibrous asbestos, gannister, etc.), forming the best possible combination for resisting heat. It will crack or crumble less than any other kind, and is chemically prepared to prevent clinkers. It is suited equally for full linings or partial repairs, and does nicely for places where no other linings can be made to fit.

The bricks are pressed into convenient shape for retailing, each brick being octagon in form, measuring 6x6x2 inches in thickness and have a label pasted on each giving full directions as to use. They are packed 10 pieces in a crate, as shown in the above cut.

Directions for Use.

This Patent Lining is to be used as a mortar or in a plastic state, to be put on with a trowel or the hand. Break the brick into small pieces and make into a very stiff putty by adding a very little water; have the stove quite clean; then apply the material where needed, making the lining about one inch thick; to finish, wet the trowel and rub quite smooth. Make a light wood fire at first to dry out the moisture. Save out a little of the prepared material to fill any cracks that may come at first fire from excess of moisture. Packed 10 pieces in a crate.

Per crate $1.00

SPOOL  WIRE.

All sizes packed one dozen spools in a box. Coppered wire, Nos. 16 to 26, put up on ¼, ½, and 1 pound spools to order.

Bright and Annealed Wire List.

Sizes of Wire.	1 lb. Spools. Per Doz.	½ lb. Spools Per Doz.	¼ lb. Spools Per Doz.	1 oz. Spools Per Doz.	1 oz. Small Spools Per Doz.
14	.....	.....	.....	.....	.....
15	.....	.....	.....	.....	.....
16	$3 65	$2 35	$1 20	.....	.....
17	3 75	2 40	1 25	.....	.....
18	3 90	2 45	1 30	.....	.....
19	4 00	2 50	1 40	.....	.....
20	4 10	2 50	1 40	.....	.....
21	4 25	2 60	1 40	.....	.....
22	4 40	2 65	1 50	.....	.....
23	4 55	2 70	1 54	.....	.....
24	4 70	2 90	1 56	.....	.....
25	4 85	3 00	1 60	.....	.....
26	4 95	3 10	1 60	$1 00	$0 43
27	5 10	.....	1 70	1 10	44
28	5 40	.....	1 80	1 20	45
29	6 00	.....	2 00	1 30	46
30	6 75	.....	2 25	1 40	47
31	7 95	.....	2 65	1 50	48
32	8 70	.....	2 90	1 60	50
33	9 60	.....	3 20	1 70	52
34	10 65	.....	3 55	1 90	54
35	11 40	.....	3 80	2 10	60
36	12 00	.....	4 00	2 30	66
38	15 00	.....	5 00	2 70	80
40	23 00	.....	8 00	4 50	1 45

Discount.....

Patent Annealed Tinned Wire List.

Sizes of Wire.	1 lb. Spools Per Doz.	½ lb. Spools Per Doz.	¼ lb. Spools Per Doz.	1 oz. Spools Per Doz.	1 oz. Small Spools Per Doz.
14	.....	.....	.....	.....	.....
15	.....	.....	.....	.....	.....
16	$5 25	$3 10	$1 75	.....	.....
17	5 30	3 15	1 80	.....	.....
18	5 45	3 20	1 80	.....	.....
19	5 55	3 25	1 85	.....	.....
20	5 60	3 25	1 85	.....	.....
21	5 75	3 45	1 90	.....	.....
22	6 00	3 50	2 00	.....	.....
23	6 15	3 60	2 05	.....	.....
24	6 25	3 70	2 10	.....	.....
25	6 40	3 80	2 15	.....	.....
26	6 75	3 90	2 25	$1 50	$0 50
27	.....	.....	2 35	1 60	52
28	.....	.....	2 50	1 70	54
29	.....	.....	2 75	1 80	55
30	.....	.....	3 00	1 90	56
31	.....	.....	3 25	2 00	58
32	.....	.....	3 60	2 10	60
34	.....	.....	4 00	2 25	61
34	.....	.....	4 30	2 50	62
35	.....	.....	4 60	2 75	68
36	.....	.....	5 00	3 00	75
38	.....	.....	.....	.....	.....
40	.....	.....	.....	.....	.....

Discount.....

Patent Annealed Galvanized Wire List.

Sizes of Wire.	1 lb. Spools Per Doz.	½ lb. Spools Per Doz.	¼ lb. Spools Per Doz.	1 oz. Spools Per Doz,	1 oz. Small Spools Per Doz.
14	.....	.....	.....	.....	.....
15	.....	.....	.....	.....	.....
16	$4 20	$2 55	$1 45	.....	.....
17	4 35	2 65	1 50	.....	.....
18	4 50	2 75	1 55	.....	.....
19	4 70	2 85	1 60	.....	.....
20	4 85	2 90	1 65	.....	.....
21	5 00	3 00	1 70	.....	.....
22	5 15	3 10	1 75	.....	.....
23	5 20	3 25	1 80	.....	.....
24	5 50	3 50	1 90	.....	.....
25	5 75	3 75	2 00	.....	.....
26	6 00	4 00	2 25	$1 50	$0 50
27	.....	.....	2 35	1 60	52
28	.....	.....	2 50	1 70	54
29	.....	.....	2 75	1 80	55
30	.....	.....	3 00	1 90	56
31	.....	.....	3 25	2 00	58
32	.....	.....	3 60	2 10	60
33	.....	.....	4 00	2 25	61
34	.....	.....	4 30	2 50	62
35	.....	.....	4 60	2 75	68
36	.....	.....	5 00	3 00	75
38	.....	.....	.....	.....	.....
40	.....	.....	.....	.....	.....

Discount.....

Pure Soft Copper Wire List.

Sizes of Wire.	1 lb. Soools Per Doz.	½ lb. Spools Per Doz.	¼ lb. Spools Per Doz.	1 oz. Spools Per Doz.	1 oz. Small Spools Per Doz.
14	$11 76	$6 24	$3 52	.....	.....
15	11 76	6 24	3 52	.....	.....
16	11 76	6 24	3 52	.....	.....
17	12 12	6 32	3 56	.....	.....
18	12 12	6 32	3 56	.....	.....
19	12 36	6 34	3 60	$2 70	$1 60
20	12 36	6 34	3 60	2 70	1 60
21	12 60	6 72	3 68	2 80	1 65
22	15 12	7 04	3 84	3 06	1 68
23	15 12	7 36	4 00	3 12	1 75
24	17 80	7 52	4 16	3 28	1 77
25	17 80	7 68	4 32	3 44	1 84
26	18 04	7 84	4 32	3 64	1 92
27	18 76	8 38	4 42	3 72	1 96
28	18 76	8 68	4 57	3 72	1 96
29	18 76	9 37	4 82	3 88	2 04
30	20 76	10 44	5 07	3 88	2 04
31	22 20	11 50	5 32	3 88	2 04
32	23 88	12 00	5 77	4 03	2 12
33	26 40	13 60	6 57	4 03	2 12
34	30 12	15 32	7 55	4 94	2 60
35	39 96	19 52	9 40	4 94	2 60
36	45 48	23 00	11 60	5 10	2 68
38	59 64	.....	.....	.....	.....
40	165 12	.....	..	.....	.....

Discount.....

REPUBLIC KALAMEINED SHEET IRON.

BRANDED.

KALAMEIN.

TRADE MARK

Made by the Republic Iron Works.

Kalamein is positively not a leaded coating, on the contrary, it is a combination of non-corrosive metals, and its application to iron renders it soft and pliable, making it especially suitable for cornices, roofing, and numerous other purposes.

Kalamein Iron can be readily soldered without the use of acid, and makes a strong seam. This great advantage alone is sufficient to give it the preference over galvanized iron, which cannot be soldered without the use of acid, and frequently breaks in the seam.

No.	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**
Per pound	.12	.12	.12	.12	.12	.12	.12	.13	.13	.13	.13	.14	.14	.15	.16	.18

Discount.....

Nos.	Standard sizes.	Extreme sizes.
10 to 17 iron.	24, 26, 28, and 30 × 72 and 96 inches.	44 × 120 inches.
18 to 20 iron.	24, 26, 28, and 30 × 72 and 96 inches.	44 × 120 inches.
21 to 24 iron.	24, 26, 28, and 30 × 72 and 96 inches.	44 × 96 inches.
25 and 26 iron.	24, 26, 28, and 30 × 72 and 96 inches.	36 × 96 inches.
27 and 28 iron.	24, 26, 28, and 30 × 72 and 96 inches.	30 × 96 inches.

Additional prices on extra sizes.

On No. 18, and Lighter, as Follows:

EXTRA WIDTHS.

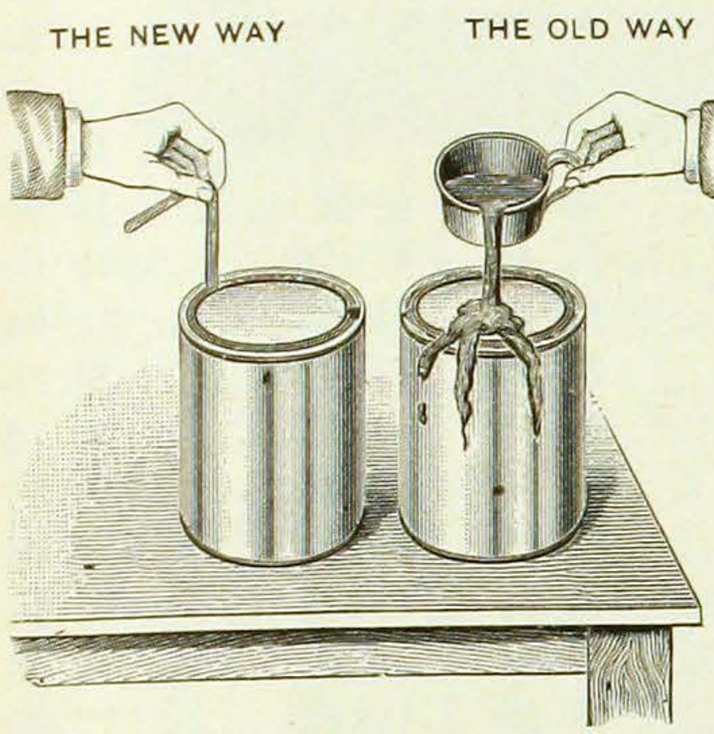
Less than 24 and not less than 22 inches wide	per pound	$0.00½
Less than 22 and not less than 20 inches wide	per pound	.01
Less than 20 and not less than 18 inches wide	per pound	.01½
32 inch, and not over 36 inch wide	per pound	.01½
37 inch, and not over 44 inch wide	per pound	.02½

EXTRA LENGTHS.

One-half cent per pound additional for pattern sheets,—*i.e.*, all iron which is required to be of exact lengths specified, or of the same length; but iron of any length between 72 and 96 inches inclusive, in bundles—in which one or two sheets of the same number and width, but shorter than full length ordered, are allowed to be put up in each bundle —will be considered ordinary length or merchant iron, and will not be subject to any extra charge.

Corrugated Kalamein, one-quarter cent per pound net extra.

IMPROVED SELF-MELTING WAX STRINGS.





A nice, clean, simple, cheap, and most reliable article for sealing fruit cans and jars.

Directions for Use.

Have the fruit boiling hot. For tin cans the heat of the fruit is sufficient. For glass and stone jars it is necessary to heat the rims by placing a hot flat iron on them to drive out all air after being filled with fruit. Fill cans or jars full; wipe the groove dry and clean; heat the lids and put on hot; make the strings quite warm and pliable; place the string in the groove; press into place with a wet cloth or finger by going round the can or jar until all is smooth and level, using sufficient pressure. If the can or jar is too cool set it in a hot stove oven until the wax is soft, then rub down smooth, overlaying the ends of string. It is necessary in some cases to use two strings. To remove the lid heat it slightly. No failure if directions are followed. Use 12 inch strings for tin cans or jars with large openings; 8 inch for quart and half gallon glass and stone jars.

Price, per case of 1000 strings $2.00

PRICE LIST BEST QUALITY NORTH CAROLINA MICA.

Size.	Price per lb.
1½x2	$0 40
1½x2¼	50
1½x2½	50
1½x2¾	50
1½x3	50
1½x3¼	50
1½x3½	50
1½x4	62
1½x4¼	1 00
1¾x2	50
1¾x2¼	50
1¾x2½	50
1¾x2¾	50
1¾x3	50
1¾x3¼	50
1¾x3½	50
1¾x3¾	62
1¾x4	62
2 x2	50
2 x2¼	50
2 x2½	50
2 x2¾	50
2 x3	62
2 x3¼	62
2 x3½	62
2 x3¾	75
2 x4	1 12
2 x4¼	1 25
2 x4½	1 50
2 x5	2 00
2 x5½	2 30
2 x6	3 13
2 x7	3 25
2 x8	3 75
2¼x2¼	50
2¼x2½	50
2¼x2¾	62
2¼x3	62
2¼x3¼	75
2¼x3½	88
2¼x3¾	1 12
2¼x4	1 34
2¼x4¼	1 88

Size.	Price per lb.
2¼x4½	$2 25
2¼x4¾	2 60
2¼x5	4 00
2¼x5¼	4 00
2¼x5½	4 60
2¼x6	5 15
2¼x6¼	5 15
2¼x6½	5 15
2½x2½	62
2½x2¾	75
2½x3	75
2½x3¼	88
2½x3½	1 12
2½x3¾	1 25
2½x4	1 50
2½x4¼	2 12
2½x4½	3 12
2½x4¾	3 75
2½x5	5 25
2½x5¼	5 25
2½x5½	5 25
2½x6	5 40
2½x6½	6 00
2½x7	6 00
2½x8	6 00
2¾x2¾	88
2¾x3	1 00
2¾x3¼	1 25
2¾x3½	1 50
2¾x3¾	1 88
2¾x4	2 00
2¾x4¼	3 12
2¾x4½	4 60
2¾x4¾	5 40
2¾x5	6 25
2¾x5¼	6 80
2¾x5½	7 75
2¾x6	8 00
3 x3	1 88
3 x3¼	2 12
3 x3½	2 75
3 x3¾	3 40
3 x4	4 30

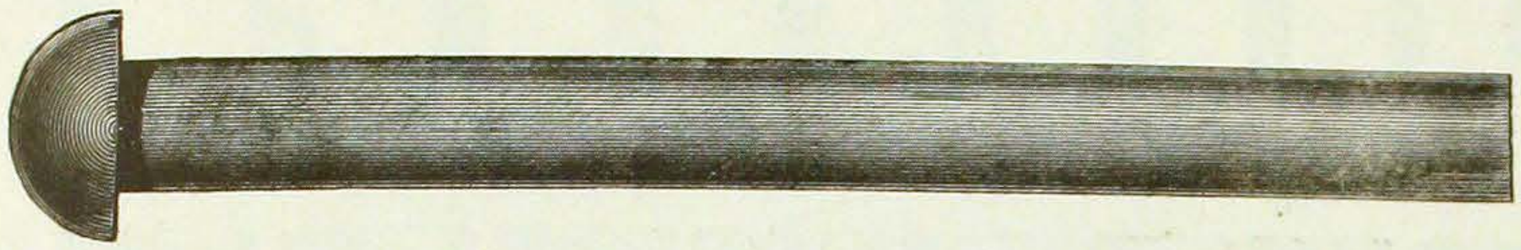
Size.	Price per lb.
3 x4¼	$ 5 25
3 x4½	6 75
3 x4¾	8 75
3 x5	10 25
3 x5½	10 25
3 x6	11 40
3 x6½	11 40
3 x7	11 40
3 x8	11 40
3 x9	11 40
3¼x3¼	3 75
3¼x3½	5 00
3¼x3¾	5 60
3¼x4	6 25
3¼x4¼	6 88
3¼x4½	7 50
3¼x4¾	8 75
3¼x5	10 75
3¼x5¼	10 75
3¼x5½	11 40
3½x3½	6 25
3½x3¾	7 50
3½x4	8 12
3½x4¼	8 75
3½x4½	9 38
3½x4¾	10 00
3½x5	10 75
3½x5¼	10 75
3½x5½	11 40
3½x6	12 00
3½x6½	12 00
3½x7	12 00
3½x8	12 00
3¾x3¾	8 00
3¾x4	8 50
3¾x4¼	9 70
3¾x4½	9 70
4 x4	9 10
4 x4¼	9 70
4 x4½	10 00
4 x5	10 75
4 x5¼	10 75
4 x5½	11 40

Size.	Price per lb.
4 x6	$12 00
4 x6½	12 00
4 x7	12 00
4 x8	12 00
4 x9	12 00
4 x10	12 00
4¼x4¼	10 00
4¼x4½	10 00
4¼x5	10 75
4½x4½	10 35
4½x5	10 75
4½x5½	11 40
4½x6	12 00
4½x6½	12 00
4½x7	12 00
4½x8	12 00
4½x9	12 00
5 x5	10 75
5 x5½	12 00
5 x6	12 00
5 x6½	12 00
5 x7	12 00
5 x8	12 50
5 x9	12 50
5 x10	12 50
5½x6	12 50
5½x7	12 50
5½x8	12 50
5½x9	12 50
6 x6	12 50
6 x6½	12 50
6 x7	13 40
6 x8	13 40
6 x9	13 65
6 x10	13 65
7 x7	13 65
7 x8	13 65
7 x9	13 65
7 x10	13 65
8 x8	13 65
8 x9	13 65
8 x10	13 65
All Larger,	13 65

Discount.....per cent.

IRON RIVETS IN BULK.

List for Round, Flat, Wagon Box, Truss, Wheel, or other style heads in quantities.



Price per pound.

Size.	Length of Rivets.													
	½	15/32	7/16	13/32	⅜	11/32	5/16	9/32	¼	7/32	3/16	5/32	⅛	3/32
7/16, ⅜, 11/32	14	14	14											
5/16	14	14	14	14½	14½									
1	14	14	14	15	15	15								
2	14	14	14	15	15	15	16							
3	15	15	15	16	16	16	17	17	18					
¼	15	15	15	16	16	16	17	17	18	18	18			
4	15	15	15	16	16	16	17	17	18	18	18	19		
5	16	16	16	16	16	17	17	18	18	19	19	20	20	21
6	16	16	16	16	17	17	18	18	19	20	21	22	22	23
3/16	16	16	16	16	17	17	18	18	19	20	22	23	24	25
7	17	17	17	17	17	17	18	18	19	20	22	23	24	25
8	18	18	18	18	18	18	19	19	19	21	22	23	24	25
9	19	19	19	20	20	21	21	21	21	23	25	27	29	30
10	20	20	21	22	23	25	27	28	28	30	33	35	37	38
11	21	22	24	26	27	28	30	31	31	33	37	40	42	45
12	22	24	26	28	29	30	32	34	35	36	41	45	50	55
13	26	27	30	33	34	35	37	39	40	41	45	50	55	60
14	28	30	35	38	40	45	50	52	54	56	58	60	63	65

Rivets made from wire smaller than No. 14, all lengths, 70 cents per pound. Tinning, 6 cents per pound extra.

Discount.....

Flat Head. Round Head. Bevel Head.



HAME RIVETS.

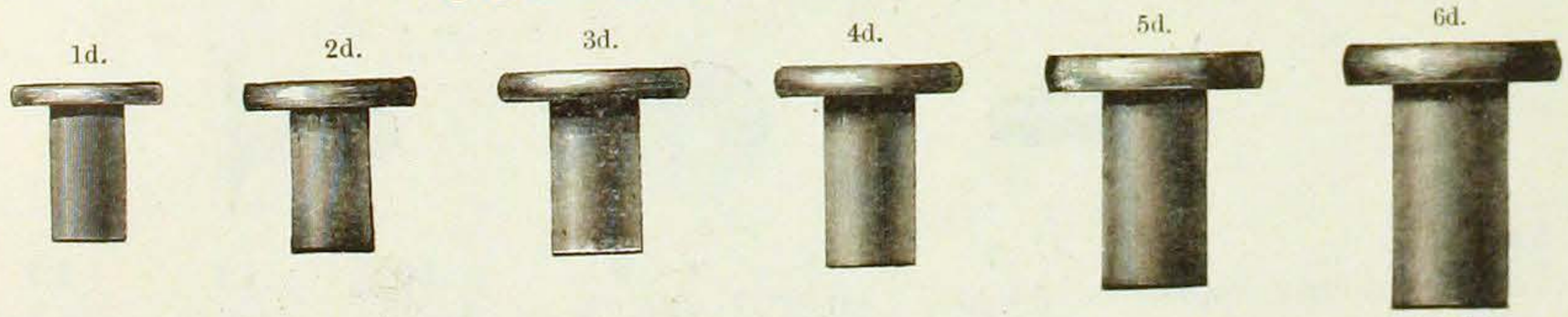
Nos.	**6**	3/16	**7**	**8**
Per pound, ½ inch and longer	$0.16	$0.16	$0.17	$0.18

Tinning, 6 cents per pound advance.

Discount.....

COOPERS' RIVETS.

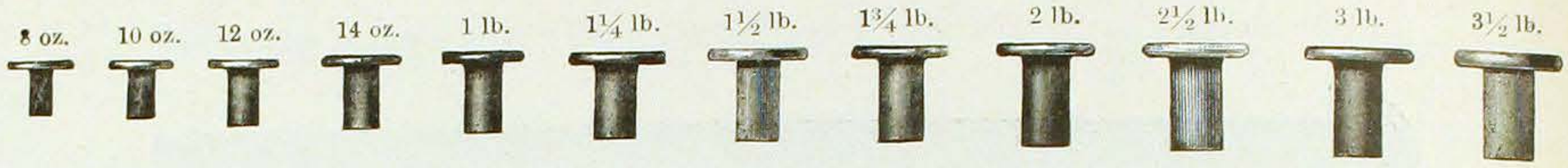
1d. 2d. 3d. 4d. 5d. 6d.

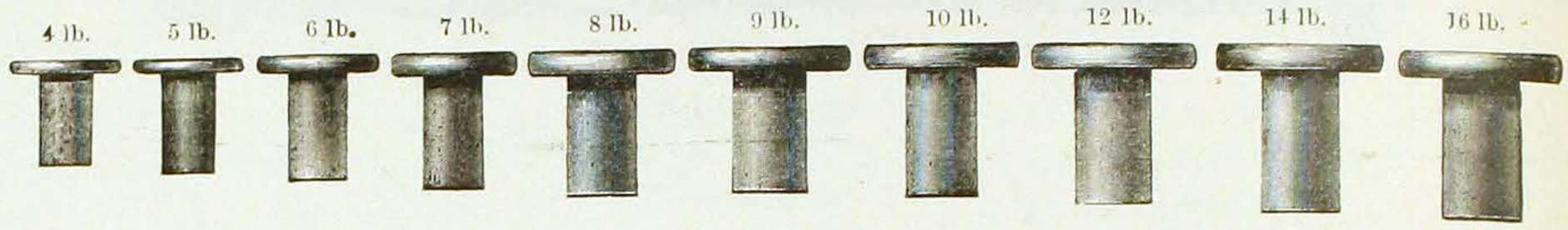


Per lb. .	$0.15	$0.15	$0.14	$0.14	$0.14	$0.14

Discount.....

THOUSAND RIVETS.





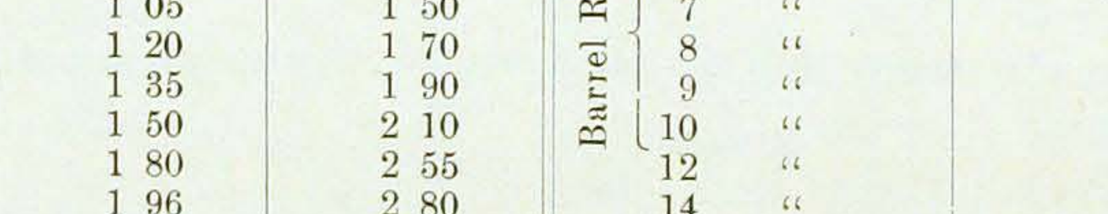
In Papers—Per 1000.			In Bulk—Per Pound.		
Size.	Black.	Tinned.	Size.	Black.	Tinned.
8 Ounce.	$0 20	$0 24	8 Ounce	$0 38	$0 45
10 "	22	25	10 "	34	40
12 "	24	28	12 "	31	37
14 "	26	30	14 "	29	35
1 Pound.	27	33	1 Pound.	26	32
1¼ "	29	37	1¼ "	23	29
1½ "	32	41	1½ "	21	27
1¾ "	36	47	1¾ "	20	26
2 "	40	52	2 "	19	25
2½ "	47	63	2½ "	18	24
3 "	53	72	3 "	17	23
3½ "	58	80	3½ "	16	22
4 "	64	88	4 "	16	22
5 "	80	1 10	Barrel Rivets. 5 "	16	22
6 "	90	1 26	6 "	15	21
7 "	1 05	1 50	7 "	15	21
8 "	1 20	1 70	8 "	15	21
9 "	1 35	1 90	9 "	15	21
10 "	1 50	2 10	10 "	15	21
12 "	1 80	2 55	12 "	15	21
14 "	1 96	2 80	14 "	14	20
16 "	2 25	3 25	16 "	14	20

All kinds of special rivets furnished to order.

Discount.....

BELT RIVETS AND BURRS.

IRON, TINNED.



Nos.	7	8	9	10	11	12	13
Per pound, any length	$0.26	$0.27	$0.28	$0.29	$0.30	$0.35	$0.38

Belt Rivets without Burrs are invoiced from bulk list.

Discount.....

TRUNK RIVETS.

IRON, TINNED.

	½	7/16	⅜	5/16	¼
No. 9 Per pound	$0.24	$0.25	$0.26	$0.27	$0.27

Discount.....

SWEDES IRON BURRS.



PRICE, PER POUND.

Number.	Black.	Tinned.	Number.	Black.	Tinned.
3/8	.25	.31	3/16	.30	.36
11/32	.25	.31	7	.32	.38
5/16	.25	.31	8	.33	.39
1	.25	.31	9	.34	.40
2	.25	.31	10	.35	.41
3	.25	.31	11	.36	.42
1/4	.25	.31	12	.42	.48
4	.26	.32	13	.42	.48
5	.27	.33	14	.45	.51
6	.30	.36			

Discount.....

FLAT HEAD STOVE BOLTS.

PRICE PER 100.



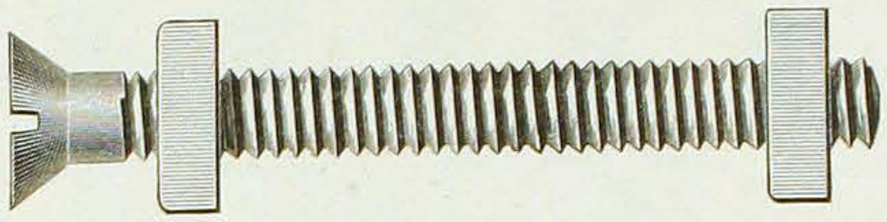
Length.	5-32 Inch.	3-16 Inch.	7-32 Inch.	¼ Inch.	5-16 Inch.	⅜ Inch.	Length.	5-32 Inch.	3-16 Inch.	7-32 Inch.	¼ Inch.	5-16 Inch.	⅜ Inch.
3/8 Inch.	$0 60	$0 60	...	...	.....	.....	3 Inch.	...	$1 05	$1 07	$1 10	$1 50	$2 60
1/2 "	60	60	$0 62	$0 65	.....	.....	3¼ "	...	1 10	1 12	1 15	1 55	2 70
5/8 "	60	60	62	65	.....	.....	3½ "	...	1 15	1 17	1 20	1 60	2 80
3/4 "	60	60	62	65	$1 05	$2 20	3¾ "	...	1 20	.....	1 25	1 65	2 90
7/8 "	65	65	67	70	1 10	2 20	4 "	...	1 25	.....	1 30	1 70	3 00
1 "	65	65	67	70	1 10	2 20	4¼ "	...	1 30	.....	1 35	1 75	3 10
1⅛ "	70	70	72	75	1 15	2 20	4½ "	...	1 35	.....	1 40	1 80	3 20
1¼ "	70	70	72	75	1 15	2 20	4¾ "	...	1 40	.....	1 45	1 85	3 30
1⅜ "	75	75	77	80	1 20	2 20	5 "	...	1 45	.....	1 50	1 90	3 40
1½ "	75	75	77	80	1 20	2 20	5¼ "	...	1 50	.....	1 55	1 95	3 50
1¾ "	80	80	82	85	1 25	2 20	5½ "	...	1 55	.....	1 60	2 00	3 60
2 "	85	85	87	90	1 30	2 20	5¾ "	...	1 60	.....	1 65	2 05	3 70
2¼ "	...	90	92	95	1 35	2 30	6 "	...	1 65	.....	1 70	2 10	3 80
2½ "	...	95	97	1 00	1 40	2 40	6¼ "	...	1 70	.....	1 75	2 15	3 90
2¾ "	...	1 00	1 02	1 05	1 45	2 50	6½ "	...	1 75	.....	1 80	2 20	4 00

Nickel Plating $1.00 extra per 100.

Discount.....

SINK BOLTS.

PRICE PER 100.

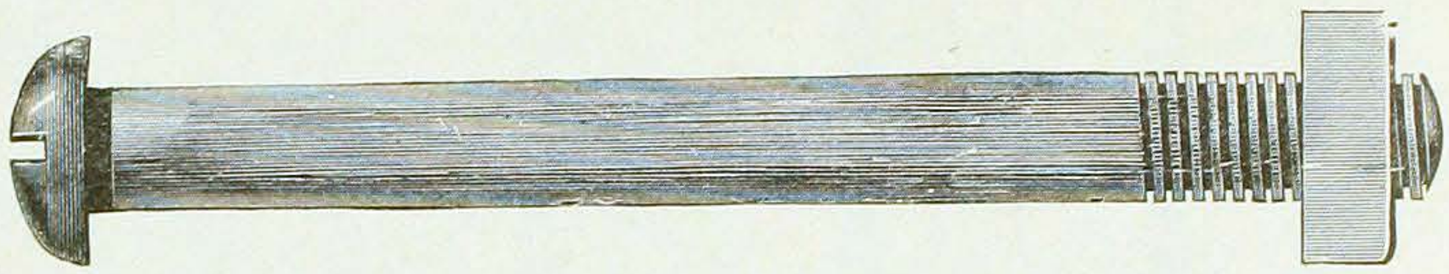


1 Inch by ¼ Inch	$1 30	2½ Inch by ¼ Inch	$1 60
1¼ " " "	1 35	2¾ " " "	1 65
1½ " " "	1 40	3 " " "	1 70
1¾ " " "	1 45	3¼ " " "	1 75
2 " " "	1 50	3½ " " "	1 80
2¼ " " "	1 55	4 " " "	1 90

Discount.....

ROUND HEAD STOVE BOLTS.

PRICE PER 100.



Length.	5-32 Inch.	3-16 Inch.	7-32 Inch.	1-4 Inch.	5-16 Inch.	3-8 Inch.
⅜ Inch.	$0 85	$0 85	$0 90	.....	.....	.....
½ "	85	85	90	$0 95	.....	.....
⅝ "	85	85	90	95	.....	.....
¾ "	85	85	90	95	$1 35	$2 50
⅞ "	90	90	95	1 00	1 40	2 55
1 "	90	90	95	1 00	1 45	2 60
1⅛ "	95	95	1 00	1 05	1 50	2 65
1¼ "	95	95	1 00	1 05	1 55	2 70
1⅜ "	1 00	1 00	1 05	1 10	1 60	2 75
1½ "	1 00	1 00	1 05	1 10	1 65	2 80
1¾ "	1 05	1 05	1 10	1 15	1 70	2 85
2 "	1 10	1 10	1 15	1 20	1 75	2 90
2¼ "	.....	1 15	1 20	1 25	1 80	3 00
2½ "	.....	1 20	1 25	1 30	1 85	3 10
2¾ "	.....	1 25	1 30	1 35	1 90	3 20
3 "	.....	1 30	1 35	1 40	1 95	3 30
3¼ "	.....	1 35	1 40	1 45	2 00	3 40
3½ "	.....	1 40	1 45	1 50	2 05	3 50
3¾ "	.....	1 45	.....	1 55	2 10	3 60
4 "	.....	1 50	.....	1 60	2 15	3 70
4¼ "	.....	1 55	.....	1 65	2 20	3 80
4½ "	.....	1 60	.....	1 70	2 25	3 90
4¾ "	.....	1 65	.....	1 75	2 30	4 00
5 "	.....	1 70	.....	1 80	2 35	4 10
5¼ "	.....	1 75	.....	1 85	2 40	4 20
5½ "	.....	1 80	.....	1 90	2 45	4 30
5¾ "	.....	1 85	.....	1 95	2 50	4 40
6 "	.....	1 90	.....	2 00	2 55	4 50
6¼ "	.....	1 95	.....	2 05	2 60	4 60
6½ "	.....	2 00	.....	2 10	2 65	4 70

Nickel plating, $1.00 extra per 100.

Discount.....

FLAT AND ROUND HEAD STOVE RODS.

PRICE PER 100.

Flat Head.						Round Head.					
Length. Inches.	3-16	1-4	Length. Inches.	3-16	1-4	Length. Inches.	3-16	1-4	Length. Inches.	3-16	1-4
7	$2 05	$2 60	24	$3 85	$6 00	7	$2 20	$2 95	24	$4 45	$6 80
7½	2 10	2 70	24½	3 90	6 10	7½	2 25	3 10	24½	4 50	6 90
8	2 15	2 80	25	3 95	6 20	8	2 35	3 20	25	4 60	7 00
8½	2 20	2 90	25½	4 00	6 30	8½	2 40	3 30	25½	4 65	7 15
9	2 25	3 00	26	4 05	6 40	9	2 45	3 40	26	4 70	7 25
9½	2 30	3 10	26½	4 10	6 50	9½	2 55	3 55	26½	4 80	7 35
10	2 35	3 20	27	4 15	6 60	10	2 60	3 65	27	4 85	7 45
10½	2 40	3 30	27½	4 25	6 70	10½	2 65	3 75	27½	4 90	7 60
11	2 45	3 40	28	4 30	6 80	11	2 75	3 85	28	5 00	7 70
11½	2 50	3 50	28½	4 35	6 90	11½	2 80	4 00	28½	5 05	7 80
12	2 55	3 60	29	4 40	7 00	12	2 85	4 10	29	5 10	7 90
12½	2 65	3 70	29½	4 45	7 10	12½	2 95	4 20	29½	5 20	8 05
13	2 70	3 80	30	4 50	7 20	13	3 00	4 30	30	5 25	8 15
13½	2 75	3 90	30½	4 55	7 30	13½	3 05	4 45	30½	5 30	8 25
14	2 80	4 00	31	4 60	7 40	14	3 15	4 55	31	5 40	8 35
14½	2 85	4 10	31½	4 65	7 50	14½	3 20	4 65	31½	5 45	8 50
15	2 90	4 20	32	4 70	7 60	15	3 25	4 75	32	5 50	8 60
15½	2 95	4 30	32½	4 75	7 70	15½	3 35	4 90	32½	5 60	8 70
16	3 00	4 40	33	4 80	7 80	16	3 40	5 00	33	5 65	8 80
16½	3 05	4 50	33½	4 85	7 90	16½	3 45	5 10	33½	5 70	8 95
17	3 10	4 60	34	4 90	8 00	17	3 55	5 20	34	5 75	9 05
17½	3 15	4 70	34½	4 95	8 10	17½	3 60	5 35	34½	5 85	9 15
18	3 20	4 80	35	5 05	8 20	18	3 65	5 45	35	5 90	9 25
18½	3 25	4 90	35½	5 10	8 30	18½	3 70	5 55	35½	5 95	9 40
19	3 30	5 00	36	5 15	8 40	19	3 80	5 65	36	6 05	9 50
19½	3 35	5 10	36½	5 20	8 50	19½	3 85	5 80	36½	6 10	9 60
20	3 45	5 20	37	5 25	8 60	20	3 90	5 90	37	6 15	9 70
20½	3 50	5 30	37½	5 30	8 70	20½	4 00	6 00	37½	6 25	9 85
21	3 55	5 40	38	5 35	8 80	21	4 05	6 10	38	6 30	9 95
21½	3 60	5 50	38½	5 40	8 90	21½	4 10	6 25	38½	6 35	10 05
22	3 65	5 60	39	5 45	9 00	22	4 20	6 35	39	6 45	10 15
22½	3 70	5 70	39½	5 50	9 10	22½	4 25	6 45	39½	6 50	10 30
23	3 75	5 80	40	5 55	9 20	23	4 30	6 55	40	6 55	10 40
23½	3 80	5 90				23½	4 40	6 70			

Stove rod heads are not slotted, unless so ordered

Discount.....

POINTED WIRES.





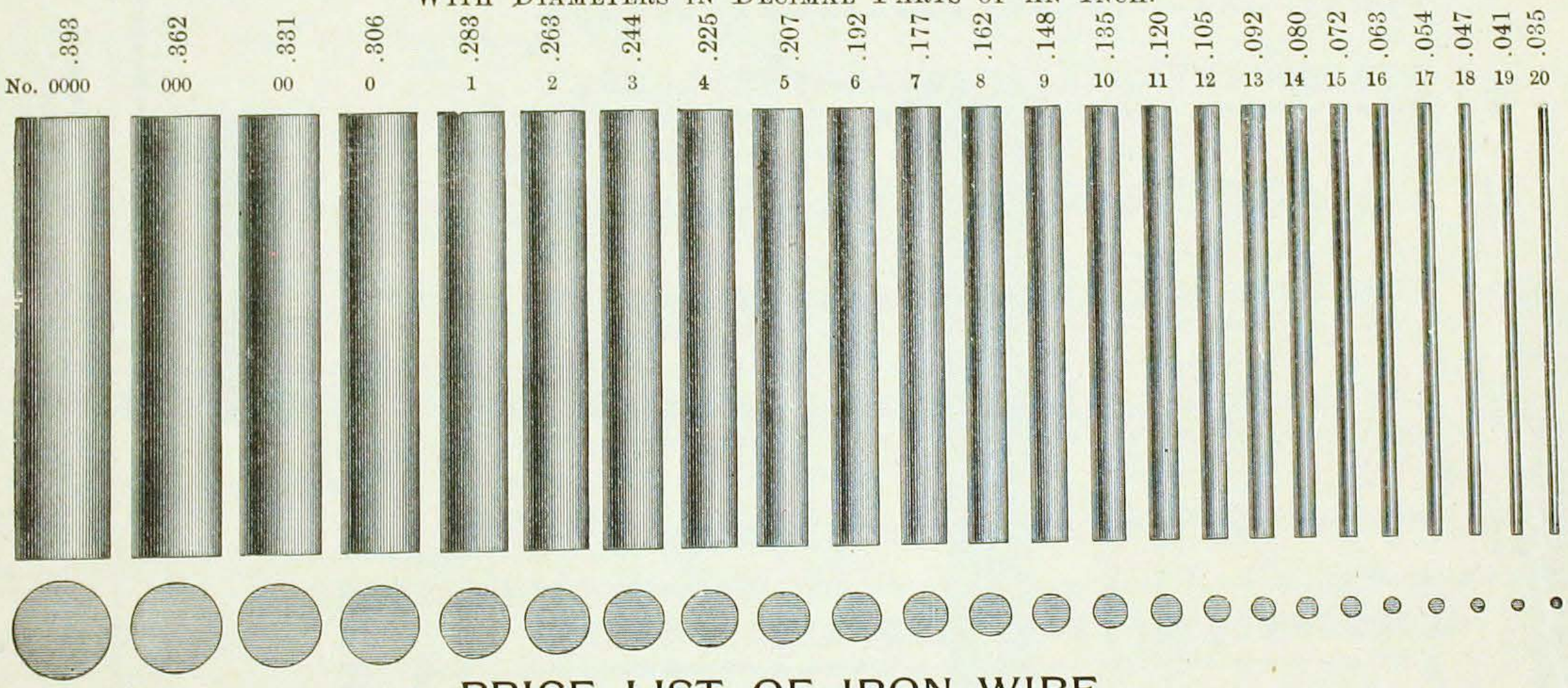
Size.	Length.	Price per Pound.
No. 10 Screw Gauge.	1, 1⅛, 1¼, Inches in Length.	16 cents.
" 11 " "	1, 1¼, " " "	16 "
" 12 " "	⅞, 1, 1⅛, 1¼, 1⅜ " " "	16 "
" 13 " "	1, 1⅛. 1¼, 1⅜, 1½ " " "	16 "
" 14 " "	1½	

Other lengths and sizes made to order at special prices.

Discount.....

STANDARD SIZES OF WIRE BY STUBB'S WIRE GAUGE,

With Diameters in Decimal Parts of an Inch.



PRICE LIST OF IRON WIRE.

Nos.	**0 to 9**	**10 and 11**	**12**	**13 and 14**	**15 and 16**	**17**	**18**
Per pound	$0.10	$0.11	$0.11½	$0.12½	$0.14	$0.15	$0.16

Discount.....

Nos.	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**
Per pound	$0.19	$0.20	$0.21	$0.22	$0.23	$0.24	$0.25	$0.26

Discount.....

Nos.	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
Per pound	$0.28	$0.29	$0.30	$0.32	$0.33	$0.35	$0.37	$0.40	$0.45	$0.55

Discount.....

Nos.	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**
Per pound	$0.40	$0.45	$0.50	$0.55	$0.60	$0.65	$0.75	$0.85	$1.00	$1.15	$1.40

Discount.....

STRAIGHTENING AND CUTTING IRON WIRE.

Nos.	**00000 to 5**	**6 to 9**	**10 and 11**	**12 to 16**	**17 to 20**
Per pound	$0.01	$0.2	$0.03	$0.04	$0.05

For cutting to lengths of less than 20 inches higher rates will be charged.

PRICE LIST COPPERED IRON WIRE.

Nos.	**0 to 9**	**10 and 11**	**12**	**13 and 14**	**15 and 16**	**17**	**18**
Per pound	$0.10	$0.11	$0.11½	$0.12½	$0.14	$0.15	$0.16

Discount.....

PRICE LIST GALVANIZED WIRE.

Nos.	**0 to 9**	**10 and 11**	**12**	**13 and 14**	**15 and 16**	**17**	**18**
Per pound	$0.10	$0.11	$0.11½	$0.12½	$0.14	$0.15	$0.16

Discount.....

PRICE LIST GALVANIZED STONE WIRE.

Nos.	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
Per pound	$0.19	$0.20	$0.21	$0.22	$0.23	$0.24	$0.25	$0.26	$0.28	$0.29	$0.30	$0.32

Discount.....

PRICE LIST TINNED WIRE.

Nos.	**0 to 9**	**10 and 11**	**12, 13, and 14**	**15 and 16**	**17**	**18**
Per pound	$0.15	$0.16	$0.17	$0.17½	$0.18	$0.18½

Discount.....

PRICE LIST TINNED BROOM WIRE.

Nos.	**18, 19, and 20**	**21 and 22**	**23 and 24**
Per pound	$0.20	$0.21	$0.22

Discount.....

PRICE LIST TINNED STONE WIRE.

Nos.	**18**	**19 and 20**	**21 and 22**	**23 and 24**	**25**	**26**	**27**	**28**
Per pound	$0.18½	$0.19	$0.20	$0.21	$0.22	$0.23	$0.24	$0.25
Nos.	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
Per pound	$0.26	$0.27	$0.28	$0.32	$0.33	$0.34	$0.40	$0.48

Discount.....

PRICE LIST CAST STEEL WIRE.

Nos.	**½ inch to 6**	**7, 8, and 9**	**10 and 11**	**12**	**13**	**14**	**15**
Per pound	$0.23	$0.24	$0.25	$0.26	$0.28	$0.30	$0.32
Nos.	**16**	**17**	**18**	**19**	**20**	**21**	**22**
Per pound	$0.33	$0.34	$0.36	$0.38	$0.40	$0.50	$0.60

Discount.....

PRICE LIST GUN SCREW WIRE.

Nos.	**0 to 9**	**10 and 11**	**12, 13, and 14**	**15 and 16**	**17**	**18**
Per pound	$0.16	$0.17	$0.18	$0.19	$0.20	$0.21

Discount.....

Straightening and Cutting Coppered Wire, Galvanized Wire, Tinned Wire, Steel Wire, and Gun Screw Wire.

Nos.	**00000 to 5**	**6 to 9**	**10 and 11**	**12 to 16**	**17 to 20**
Per pound	$0.01	$0.02	$0.03	$0.04	$0.05

For cutting in lengths of less than 20 inches higher rates will be charged.

PRICE LIST BRASS AND COPPER WIRE.

Stubs' English Gauge Standard.	Com. High Brass, per pound.	Low Brass, per pound.	Gilding, Bronze, and Copper, per pound.	Stubs' English Gauge Standard.	Com. High Brass, per pound.	Low Brass, per pound.	Gilding, Bronze, and Copper, per pound.
All Nos. to 16 incl.	$0 22	$0 26	$0 30	No. 30	$0 48	$0 52	$0 62
No. 17 and No. 18	23	27	31	" 31	51	55	67
" 19 and No. 20	24	28	32	" 32	55	59	73
" 21	25	29	33	" 33	59	63	82
" 22	26	30	34	" 34	64	68	95
" 23	28	32	36	" 35	70	74	1 30
" 24	30	34	38	" 36	76	80	1 50
" 25	32	36	40	" 37	1 00	1 04	1 70
" 26	35	39	43	" 38	1 30	1 34	2 00
" 27	38	42	46	" 39	2 00	2 00	3 25
" 28	42	46	51	" 40	2 60	2 60	5 75
" 29	45	49	54				

Spring Wire, 2 cents per pound advance. Whitened Wire, 3 cents per pound advance. Flat, Square and Half Round Wire, 4 cents per pound advance on Round Wire. Fancy Wire, not less than 10 cents per pound advance on Round Wire. Spooling on one-pound spools, 12 cents per pound extra. Spooling on ten-pound spools or more, 2 cents per pound extra.

Discount.....

Special attention given to pure copper wire for electrical purposes, bare or insulated.

PRICE LIST
COPPER BELT AND HOSE RIVETS AND BURRS.

Nos.	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Per pound . . .	$0.49	$0.50	$0.52	$0.54	$0.56	$0.58	$0.60	$0.65	$0.70

Discount.....

Brass rivets not less than copper. Copper and brass rivets and burrs made to particular sizes and patterns, special price, not less than corresponding rates.

BRAZIERS' RIVETS.

Per pound . . . . . .

COPPER BOTTOMS.

Pits and flats, 14 ounces and heavier to square foot . . . per pound
Lighter than 14 ounces to square foot . . . . . per pound

O'NEILL'S PATENT PLANISHED COPPER.
STUBS' GAUGE STANDARD.
14 x 48 ONLY.

14 and 16 ounces and heavier per pound | 12 ounces . . . per pound
The same by the case . per pound | The same by the case . per pound

BOILER SIZES.
6 in., 14 x 49; 7 in., 14 x 52; 8 in., 14 x 56; 9 in., 14 x 60.

14 and 16 ounces and heavier . per pound | 12 ounces . . . per pound
The same by the case . . per pound | The same by the case . per pound

And special sizes not over 20 inches wide.

24 x 48 AND 30 x 60.

And all sizes wider than 20 inches.

14 and 16 ounces and heavier, per pound | 12 ounces . . . per pound

PLANISHED BRASS.

Same price as Planished Copper.

TINNING.

PLANISHED COPPER OR PLANISHED BRASS.

14x48, by the case. per sheet	$0.08
14x48, less than case, per sheet	.10
Boiler sizes, 6, 7, and 8 inch, per sheet	.12
Boiler sizes, 9 inch, per sheet	.15
All other sizes not larger than 30x60, per square foot.	.02½
Larger than 30x60, per square foot	.05

O'NEILL'S PATENT NICKEL-PLATED COPPER.

(We charge the Copper by weight and add for Plating by the sheet or square foot.)

SHEETS 14x48 INCHES.

	Per Pound.	Plating Per Sheet.
14 and 16 ounces and heavier, by the case of 500 pounds and over		$0.15
14 and 16 ounces and heavier, less than one case		.16
12 ounces and lighter, by the case		.15
12 ounces and lighter, less than one case		.16

BOILER SIZES.

Over 12 ounces.

	Per Pound.	Plating, Per Sheet.
By the case of 500 pounds, 6 inches (14x49)		$0.18
By the case of 500 pounds, 7 inches (14x52)		.18
By the case of 500 pounds, 8 inches (14x56)		.19
By the case of 500 pounds, 9 inches (14x60)		.21

For less quantity than one case, add 2c. per pound; 12 ounces and lighter, add 3c. per pound.

OTHER SIZES NOT OVER 20 INCHES WIDE.

	Per Pound.	Plating, Per Sq. Ft.
Over 12 ounces, by the case of 500 pounds		$0.03½
12 ounces and lighter, by the case of 500 pounds		.03½

For less quantity than one case, add 2c. per pound.

SHEETS 24x48 and 30x60 INCHES.

And other sizes over 20 inches wide.

	Per Pound.	Plating, Per Sq. Ft.
Over 12 ounces		$0.03
12 ounces and lighter		.03
For Plating larger than 30x60 sheets		.06

SPECIAL SIZES MADE TO ORDER.

Our list price is for Nickel Plating on one side.

Nickel Plating on both sides double the rates for plating on one side.

For Copper, Nickel Plated on one side and *Patent Planished* on the other side, add one cent per pound.

TINNING.

For Copper, Nickel Plated on one side and Tinned on the other, add for

Sheets 14x48, per sheet	$0.08
Sheets, other sizes, per square foot	.02½

SHEET COPPER.

We keep in stock the following sizes.

Plain Sheet Copper.

14 x 48	from 12 to 28 ounces per square foot.	60 x 120	from 120 to 300 pounds per sheet.
24 x 48	from 5 to 116 pounds per sheet.	33 x 96	from 55 to 140 pounds per sheet.
30 x 60	from 7 to 180 pounds per sheet.	36 x 72	from 18 to 260 pounds per sheet.
48 x 72	from 30 to 140 pounds per sheet.	36 x 144	from 85 to 220 pounds per sheet.
30 x 120	from 60 to 150 pounds per sheet.	48 x 144	from 120 to 300 pounds per sheet.

Sheet Copper.

TINNED ON ONE SIDE.

14 x 48	14 and 16 ounces per square foot.
24 x 48	14 and 16 ounces per square foot.
30 x 60	14 and 16 ounces per square foot.

Cold Rolled Sheet Copper.

PLAIN.

14 x 48	12, 14, and 16 ounces per square foot.
24 x 48	14 and 16 ounces per square foot.
30 x 60	14 and 16 ounces per square foot.
24 x 96	16 ounces per square foot.
30 x 96	16 ounces per square foot.
36 x 96	16 ounces per square foot.

Cold Rolled Sheet Copper,

TINNED ON ONE SIDE.

14 x 48	12, 14, and 16 ounces per square foot.
24 x 48	14 and 16 ounces per square foot.
30 x 60	14 and 16 ounces per square foot.

O'NEILL'S PATENT PLANISH COPPER.

TINNED ON ONE SIDE AND PLANISHED ON THE OTHER.

14 x 48	12, 14, and 16 ounces per square foot.
14 x 52	14 ounces per square foot. For No. 7 boiler.
14 x 56	14 ounces per square foot. For No. 8 boiler.
14 x 60	14 ounces per square foot. For No. 9 boiler.
24 x 48	14 and 16 ounces per square foot.
30 x 60	14 and 16 ounces per square foot.

COPPER BOLTS.

From $\frac{3}{8}$ to 2 inch Diameter.

Per pound

Square and half round copper bolts made to order. Special sizes sheet and bolt copper furnished at short notice.

PRICE LIST GALVANIZED SHEET IRON.

BEST BLOOM OR REFINED.

Nos. 14 to 20, inclusive	per pound	$0.12	No. 27	per pound	$0.15
Nos. 21 to 24, inclusive	per pound	.13	No. 28	per pound	.16
Nos. 25 and 26	per pound	.14	No. 29	per pound	.18

Discount for Best Bloom.....

Discount for Refined.....

For additional prices on extra sizes see next page.

Additional Prices on Extra Sizes Galvanized Best Bloom or Refined Sheet Iron.

No. 20 and lighter as follows:

EXTRA WIDTHS.

Less than 24 inches and not less than 22 inches wide	per pound	$0.0¼
Less than 22 inches and not less than 20 inches wide	per pound	.01
Less than 20 inches and not less than 18 inches wide	per pound	.1½
Over 32 inches and not over 36 inches wide	per pound	.1½
Over 37 inches and not over 40 inches wide	per pound	.2½

EXTRA LENGTHS.

One-half cent per pound additional for pattern sheets, i. e., for all iron of which every sheet in each bundle is required to be of exact length specified, or where iron is ordered in sheets, all of which are required to be of the same length.

But iron of any length, between 72 and 96 inches inclusive, in bundles, in which one or two sheets of the same number and width, but shorter than the full length ordered, are allowed to be put up in each bundle, will be considered ordinary length, or merchant iron, and will not be subject to any extra for length.

No extra charge for lengths or widths on sheet iron No. 19, and heavier.

Additional prices on extra sizes.

BLACK SHEET IRON.

BEST BLOOM OR REFINED.

On No. 20, and lighter, as follows:

EXTRA WIDTHS.

Less than 24 inches and not less than 22 inches wide	per pound	$0.0¼
Less than 22 inches and not less than 20 inches wide	per pound	.0½
Less than 20 inches and not less than 18 inches wide	per pound	.0¾
Over 32 inches and not over 36 inches wide	per pound	.01
Over 37 inches aud not over 40 inches wide	per pound	.1¼

EXTRA LENGTHS.

One-quarter cent per lb. additional for pattern sheets, i. e., for all iron of which every sheet in each bundle is required to be of exact length specified, or where iron is ordered in sheets all of which are required to be of the same length.

But sheets of any length, between 72 and 96 inches inclusive in bundles in which one or two sheets of the same number and width, but shorter than full length ordered, are allowed to be put up in each bundle, will be considered ordinary length, or merchant iron, and will not be subject to any extra for length.

No extra charge for lengths or widths on Sheet Iron No. 19 and heavier.

Additional prices on extra sizes.

BRASS KETTLES.

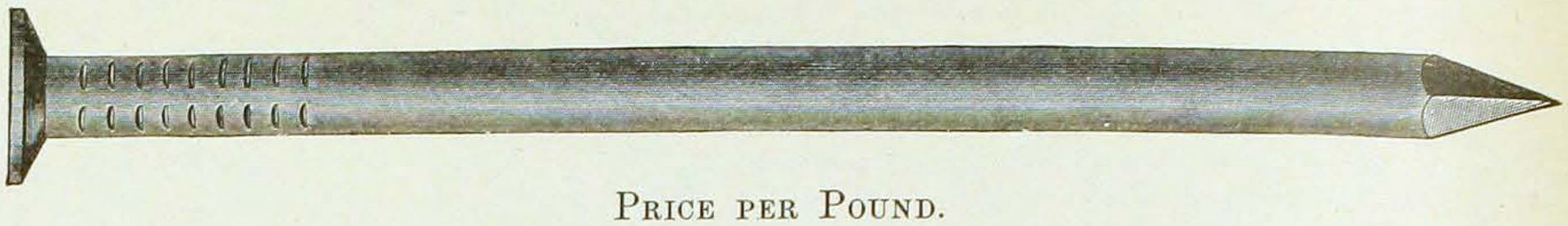
7 inch	1 pound	½ gallon.	18 inch	10½ pound	10½ gallon.
8 inch	1½ pound	1 gallon.	19 inch	12 pound	12 gallon.
9 inch	2¼ pound	1½ gallon.	20 inch	14 pound	14½ gallon.
10 inch	2¾ pound	2 gallon.	21 inch	16½ pound	17 gallon.
11 inch	3½ pound	2½ gallon.	22 inch	19¾ pound	20 gallon.
12 inch	4¼ pound	3 gallon.	23 inch	23 pound	23 gallon.
13 inch	5 pound	4 gallon.	24 inch	26½ pound	26 gallon.
14 inch	5¾ pound	5 gallon.	25 inch	29 pound	30 gallon.
15 inch	6¾ pound	6 gallon.	26 inch	31 pound	38 gallon.
16 inch	7¾ pound	7½ gallon.	27 inch	33 pound	37 gallon.
17 inch	9 pound	9 gallon.	28 inch	36 pound	42 gallon.
17 inch and under				per pound	
18 inch and over				per pound	

COPPER KETTLES.

14 gallons	weight 18 pounds each.	28 gallons	weight 33 pounds each.
16 gallons	weight 20 pounds each.	30 gallons	weight 36 pounds each.
18 gallons	weight 24 pounds each.	32 gallons	weight 38 pounds each.
20 gallons	weight 25 pounds each.	36 gallons	weight 42 pounds each.
24 gallons	weight 28 pounds each.	40 gallons	weight 43½ pounds each.
25 gallons	weight 31 pounds each.	42 gallons	weight 48 pounds each.
Per pound			

From 2 to 12 gallon kettles furnished at special rates.

STEEL WIRE NAILS.



PRICE PER POUND.

$\frac{3}{16}$ *Inch.*			$\frac{1}{4}$ *Inch.*			$\frac{3}{8}$ *Inch.*			$\frac{1}{2}$ *Inch.*			$\frac{5}{8}$ *Inch.*			$\frac{3}{4}$ *Inch.*		
No.			No.			No.			No.			No.			No.		
20	@	$0 75	14	@	$0 29	10	@	$0 22	5	@	$0 19	5	@	$0 18	3	@	$0 17
21	"	85	15	"	30	11	"	22	6	"	19	6	"	18	4	"	17
22	"	1 00	16	"	32	12	"	24	7	"	19	7	"	18	5	"	17
			17	"	36	13	"	25	8	"	19	8	"	18	6	"	17
			18	"	39	14	"	26	9	"	19	9	"	18	7	"	17
			19	"	44	15	"	27	10	"	20	10	"	19	8	"	17
			20	"	55	16	"	28	11	"	20	11	"	19	9	"	17
			21	"	60	17	"	31	12	"	20	12	"	20	10	"	17
			22	"	80	18	"	34	13	"	22	13	"	21	11	"	18
						19	"	39	14	"	23	14	"	21	12	"	18
						20	"	45	15	"	24	15	"	23	13	"	20
						21	"	50	16	"	25	16	"	23	14	"	20
						22	"	60	17	"	27	17	"	25	15	"	22
									18	"	29	18	"	27	16	"	22
									19	"	33	19	"	30	17	"	23
									20	"	38	20	"	33	18	"	25
									21	"	45	21	"	40	19	"	28
									22	"	50	22	"	50	20	"	31
															21	"	40
															22	"	55

$\frac{7}{8}$ *Inch.*			1 *Inch.*			$1\frac{1}{8}$ *Inch.*			$1\frac{1}{4}$ *Inch.*			$1\frac{1}{2}$ *Inch.*			$1\frac{3}{4}$ *Inch.*		
No.			No.			No.			No.			No.			No.		
3	@	$0 16	$\frac{5}{16}$	@	$0 14	$\frac{5}{16}$	@	$013	00	@	$0 12	00	"	11	00	@	$0 11
4	"	16	1	"	14	1	"	13	$\frac{3}{8}$	"	12	$\frac{3}{8}$	"	11	$\frac{3}{8}$	"	11
5	"	16	2	"	14	2	"	13	0	"	12	0	"	11	0	"	11
6	"	16	3	"	14	3	"	13	$\frac{5}{16}$	"	12	$\frac{5}{16}$	"	11	$\frac{5}{16}$	"	11
7	"	16	4	"	14	4	"	13	1	"	12	1	"	11	1	"	11
8	"	16	5	"	14	5	"	13	2	"	12	2	"	11	2	"	11
9	"	16	6	"	14	6	"	13	3	"	12	3	"	11	3	"	11
10	"	17	7	"	14	7	"	13	4	"	12	4	"	11	4	"	11
11	"	17	8	"	14	8	"	13	5	"	12	5	"	11	5	"	11
12	"	17	9	"	14	9	"	13	6	"	12	6	"	11	6	"	11
13	"	18	10	"	15	10	"	14	7	"	12	7	"	11	7	"	11
14	"	18	11	"	15	11	"	14	8	"	12	8	"	11	8	"	11
15	"	20	12	"	15	12	"	14	9	"	12	9	"	11	9	"	11
16	"	20	13	"	16	13	"	15	10	"	13	10	"	12	10	"	11
17	"	21	14	"	16	14	"	15	11	"	13	11	"	12	11	"	11
18	"	23	15	"	17	15	"	16	12	"	13	12	"	12	12	"	12
19	"	28	16	"	18	16	"	17	13	"	14	13	"	13	13	"	13
20	"	31	17	"	20	17	"	19	14	"	15	14	"	14	14	"	14
21	"	42	18	"	22	18	"	21	15	"	15	15	"	15	15	"	15
			19	"	27	19	"	25	16	"	16	16	"	16	16	"	16
			20	"	30	20	"	30	17	"	17	17	"	17	17	"	18
			21	"	45				18	"	21	18	"	21	18	"	22
									19	"	25	19	"	25			
									20	"	30						

For barbed nails, or nails with special heads or special points, add 1 cent per pound to list. For nails combining two or all of these specialties, add 1 cent per pound for each specialty. For tinning add 50 per cent. to list.

Discount.....

STEEL WIRE NAILS—Continued.



PRICE PER POUND.

2 *Inch.*			2¼ *Inch.*			2½ *Inch.*			2¾ *Inch.*			3 *Inch.*			3½ *Inch*		
No.			No.			No.			No.			No.			No.		
00	@	$0 10	00	@	$0 10	00	@	$0 10	00	@	$0 10	00	@	$0 10	00	@	$0 10
⅜	"	10	⅜	"	10	⅜	"	10	⅜	"	10	⅜	"	10	⅜	"	10
0	"	10	0	"	10	0	"	10	0	"	10	0	"	10	0	"	10
5/16	"	10	5/16	"	10	5/16	"	10	5/16	"	10	5/16	"	10	5/16	"	10
1	"	10	1	"	10	1	"	10	1	"	10	1	"	10	1	"	10
2	"	10	2	"	10	2	"	10	2	"	10	2	"	10	2	"	10
3	"	10	3	"	10	3	"	10	3	"	10	3	"	10	3	"	10
4	"	10	4	"	10	4	"	10	4	"	10	4	"	10	4	"	10
5	"	10	5	"	10	5	"	10	5	"	10	5	"	10	5	"	10
6	"	10	6	"	10	6	"	10	6	"	10	6	"	10	6	"	10
7	"	10	7	"	10	7	"	10	7	"	10	7	"	10	7	"	10
8	"	10	8	"	10	8	"	10	8	"	10	8	"	10	8	"	10
9	"	10	9	"	10	9	"	10	9	"	10	9	"	10	9	"	10
10	"	11	10	"	11	10	"	11	10	"	11	10	"	11	10	"	11
11	"	11	11	"	11	11	"	11	11	"	11	11	"	11	11	"	11
12	"	12	12	"	12	12	"	12	12	"	12	12	"	12	12	"	13
13	"	13	13	"	13	13	"	13	13	"	13	13	"	14			
14	"	14	14	"	14	14	"	14	14	"	15						
15	"	15	15	"	15	15	"	16									
16	"	16	16	"	17												
17	"	19															
18	"	23															

4 *Inch.*			4½ *Inch.*			5 *Inch.*			6 *Inch.*			7 *Inch.*			8 *Inch.*		
No.			No.			No.			No.			No.			No.		
00	@	$0 10	00	@	$0 10	00	@	$0 10	00	@	$0 10	00	@	$0 10	00	@	$0 10
⅜	"	10	⅜	"	10	⅜	"	10	⅜	"	10	⅜	"	10	⅜	"	10
0	"	10	0	"	10	0	"	10	0	"	10	0	"	10	0	"	10
5/16	"	10	5/16	"	10	5/16	"	10	5/16	"	10	5/16	"	10	5/16	"	10
1	"	10	1	"	10	1	"	10	1	"	10	1	"	10	1	"	10
2	"	10	2	"	10	2	"	10	2	"	10	2	"	10	2	"	10
3	"	10	3	"	10	3	"	10	3	"	10	3	"	10	3	"	10
4	"	10	4	"	10	4	"	10	4	"	10	4	"	10	4	"	10
5	"	10	5	"	10	5	"	10	5	"	10	5	"	10			
6	"	10	6	"	10	6	"	10	6	"	10	6	"	10			
7	"	10	7	"	10	7	"	10	7	"	10						
8	"	10	8	"	10	8	"	10	8	"	10						
9	"	10	9	"	10	9	"	10									
10	"	11	10	"	11	10	"	11									
11	"	11															

9 *Inch.*			10 *Inch.*			11 *Inch.*			12 *Inch.*		
No.			No.			No.			No.		
00	@	$0 10	00	@	$0 10	00	@	$0 10	00	@	$0 10
⅜	"	10	⅜	"	10	⅜	"	10	⅜	"	10
0	"	10	0	"	10	0	"	10	0	"	10
5/16	"	10	5/16	"	10	5/16	"	10	5/16	"	10
1	"	10	1	"	10	1	"	10	1	"	10
2	"	10	2	"	10						
3	"	10									

For Barbed Nails, or Nails with Special Heads or Special Points, add 1 cent per pound to List. For Nails combining two or all of these specialties, add 1 cent per pound for each specialty.

For Tinning, add 50 per cent. to List.

Discount.....

RIVETS.

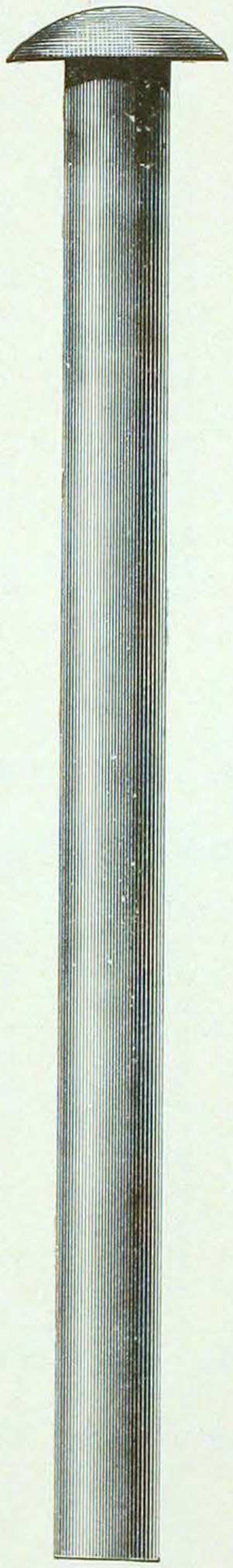
Round Head.



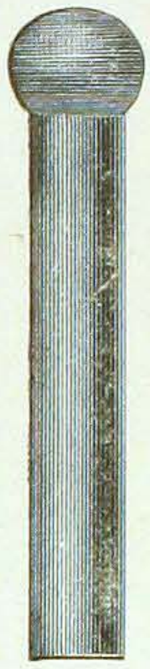
Machine Head.



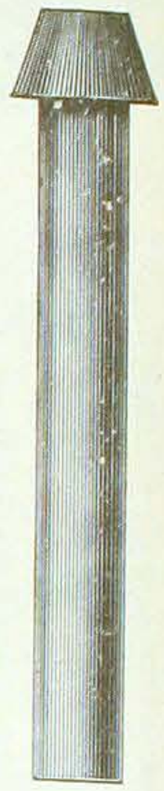
Truss Head.



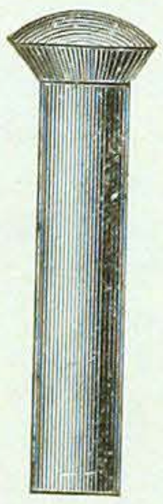
Globe Head.



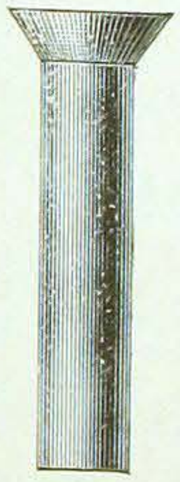
Cone Head.



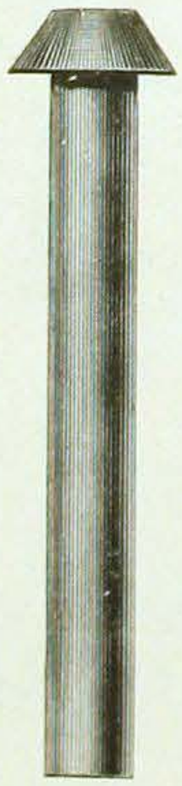
Oval Countersunk Head.



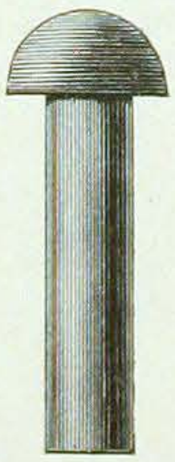
Countersunk Head.



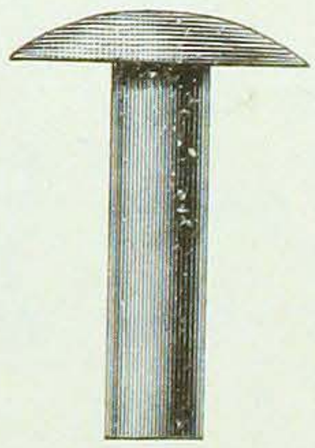
Bevel Head.



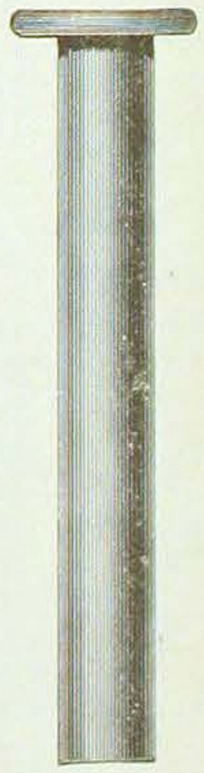
Wheel Head.



Wagon Box Head.



Flat Head.



HALL & CARPENTER'S

TINSMITHS' AND STOVEMAKERS'

MANUAL,

VALUABLE

PRACTICAL

RECEIPTS,

COMPOSITIONS,

USEFUL ARITHMETICAL RULES AND INFORMATION.

HALL & CARPENTER'S

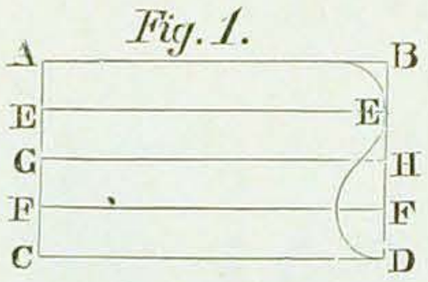
TINSMITHS' AND STOVEMAKERS' MANUAL.

PRACTICAL RULES FOR CUTTING PATTERNS.

To cut patterns correctly requires an earnest and careful attention to, and a thorough knowledge of the principles by which you should be governed. Especially is this true in patterns for tinware. The variation of one-sixteenth part of an inch often throws the vessel entirely out of shape. If the instructions herein given are strictly obeyed, all trouble with ungainly vessels and "botched" work will be obviated.

In commencing, you should study the rules and diagrams until you are *thoroughly* conversant with them. Next procure suitable instruments, such as large dividers and a correct square; be exact in laying out, and follow the diagrams implicitly, ever remembering that an ordinary lock takes up three-eights of an inch, and govern yourself accordingly; you will then be successful in cutting any pattern you may desire.

Fig. 1.

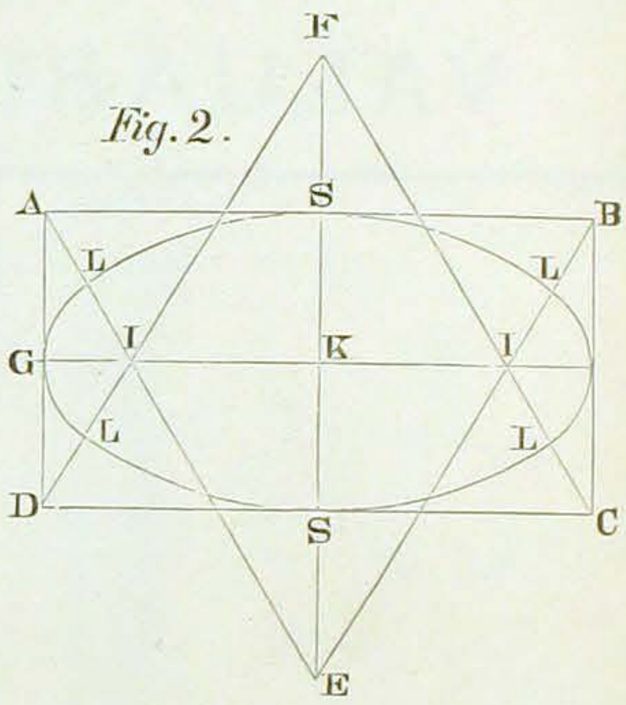


TO DESCRIBE AN OGEE.

Explanation to Fig. 1.

Form the rectangle A B C D; divide it into four equal spaces by drawing the lines E E G H and F F; spread the dividers according to the circle desired, and form the point F; describe an arc from the line G H to C B; place the dividers on the line E E, and describe an arc, in the opposite direction, to intercept with the first arc, on the line G H.

Fig. 2.



OVALS.

Explanation to Fig. 2.

Form the rectangle A B C D; A B equal to the long, and B C equal to the short diameter; divide it into four equal parts by drawing the lines F E and G G; mark the point I, one-third of the distance from G to K; then draw the lines A E, B E, D F, and C F; from E F as centre describe the arcs, L S L, L S L, and from the line G G describe the arcs L G L.

To describe an oval, one end larger than the other, form the frustrum of a cone that will contain the oval, and proceed as in Fig. 2.

MITRE.

All Mitres are drawn by means of a rectangle, as in Fig. 1, but, as they are sometimes unequal, the top usually being the shortest, it is necessary to make the distance between H and D equal to the length of the lower, and between B and H equal to the upper arc; then describe arcs from line to line, as any two arcs or circles will, when formed, mitre. This method can be applied to everything of an ogee nature; even an elbow is but a mitre; and an ogee mitre may be drawn by applying the principle explained in Fig. 5 on page 272.

OVAL FLARING VESSELS.

To cut an oval flaring vessel in four sections, take the circumference of the arcs, L S L and L G L, (Fig. 2, on page 270,) for the bottom of the pieces; form a rectangle, the length of which shall be equal to the circumference of the top of either section, and proceed as in Fig. 3. The same amount must be allowed for flare on the side pieces as on the ends; allowance to be made for locks and burrs.

Fig. 3.

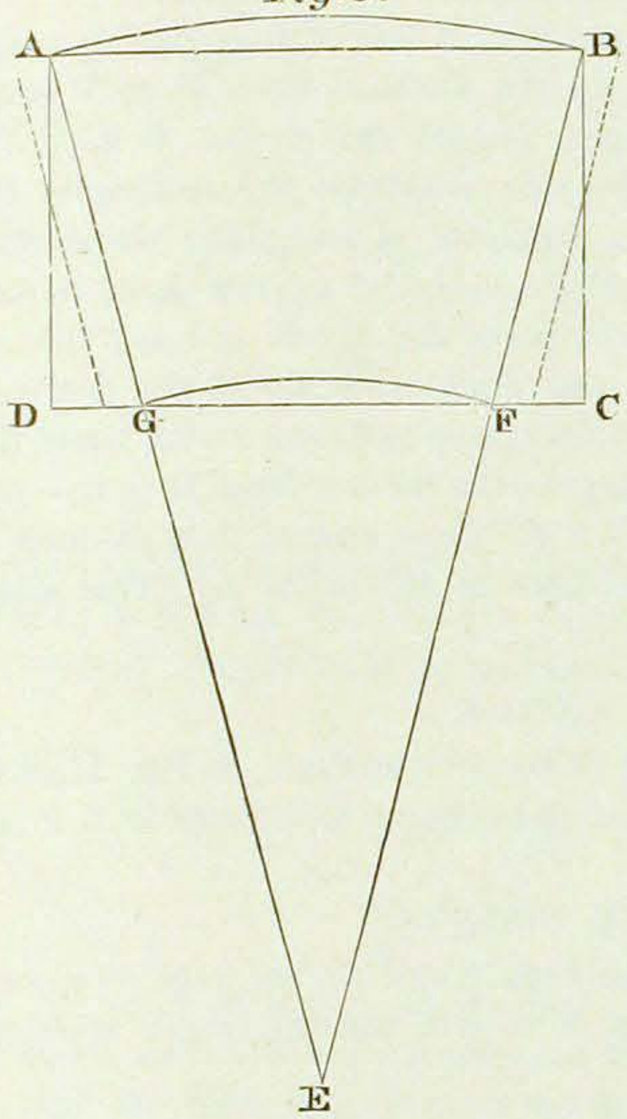
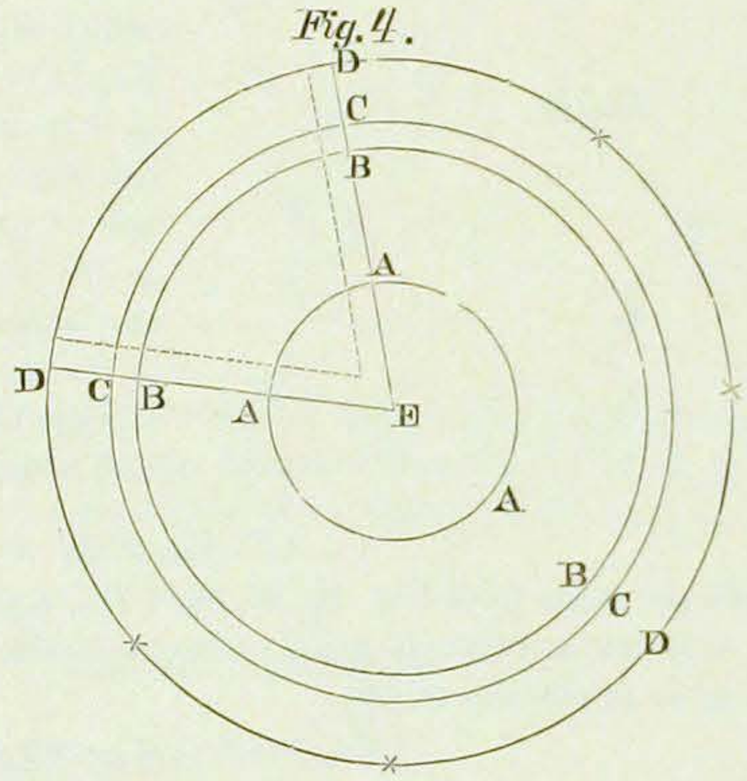


Fig. 4.



COMMON FLARING VESSELS, OR FRUSTRUM OF A CONE.

Explanation to Fig. 3.

Form the rectangle, A B C D, A B, equal to the circumference of the large end, and G F equal to the circumference of the small end, B C the height; draw the lines A G E and B F E; from E as a centre describe arcs from A to B, and G to F; allowance to be made for backs.

TO STRIKE OUT A CONE.

Form a rectangle as in Fig. 3; the distance from A to B equal to the diameter of the cone; B to C equal to the altitude; draw lines from A and B to the centre of the line C D, and from this as a centre describe an arc from A to B.

CAN TOPS AND BEVEL COVERS.

Explanation to Fig. 4.

Let the circle B be the size of the can or cover; the space between B and C for edges; the space between D and C for the flare. Spread the dividers from E to C, and divide the circle D D D into six equal parts; cut out the pieces A D D, leaving edges for locks parallel to A D. For the opening-in can tops, describe the circle A A A equal in circumference to the circumference of the opening.

To have can-tops.

$\frac{1}{2}$ Pitch. Describe a circle twice the diameter of the can; use half the circle.

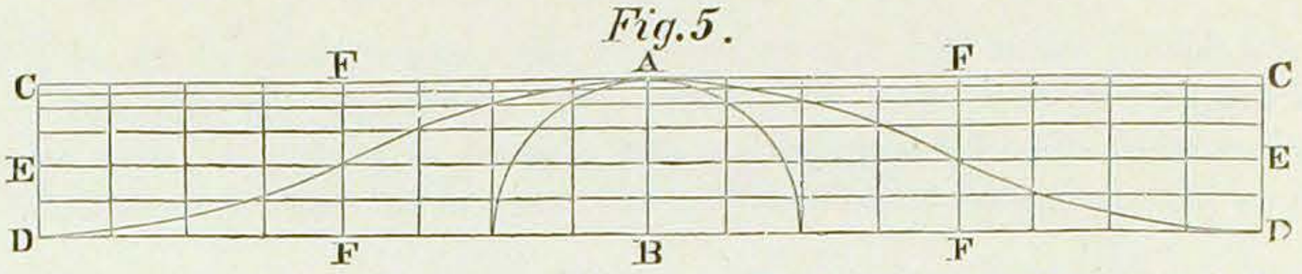
$\frac{1}{4}$ Pitch. Spread the dividers three-fourths the diameter of the can; describe a circle, and use three-quarters of it.

$\frac{1}{3}$ Pitch. Spread the dividers two-thirds the diameter of the can; describe a circle, and use two-thirds of it.

Allowance should be made for locks, but none for edges.

CIRCULAR ELBOWS.

Fig. 5.



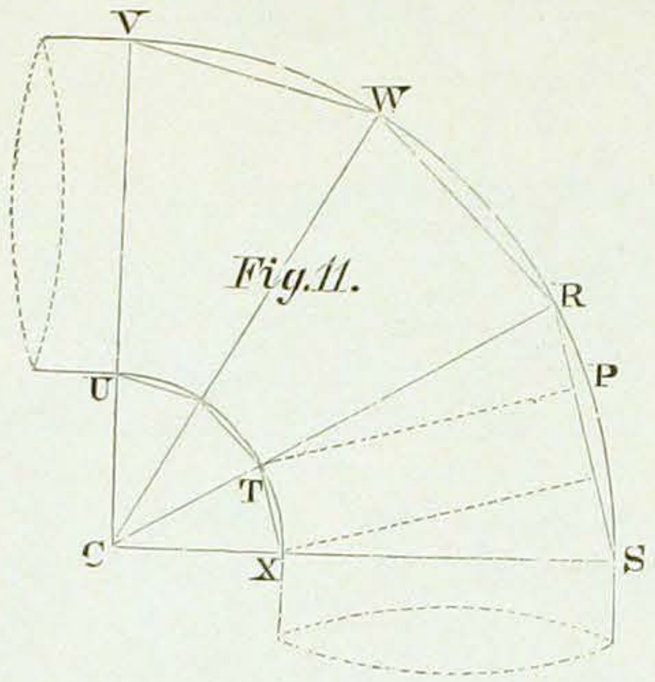


Fig. 11.

Explanation to Figs. 5 and 11.

Describe two circles, U X and V S, according to the length of the elbow desired; the distance from U to V equal to the diameter of the pipe. Divide the circles, U S, V X, into as many sections as desired; construct the rectangle, Fig. 5, the length equal to the diameter of the pipe; the width equal to R P in Fig. 11; describe an arc of a circle equal in diameter to the pipe, touching the point A; divide the arc into any number of equal parts, and draw lines across the dots parallel to D D; spread the dividers one and one-fourth times the diameter of the pipe, and describe the arc from D to the intersection of the lines F F and E E; draw curved lines through the intersection of the other lines to the point A. This will give one side of a section.

AN ELBOW OF ANY ANGLE.

Obtain the angle from Fig. 15, on page 276, and lay it off as the two sections in Fig. 11, S R W and X Y C; construct a rectangle equal in length to the diameter of the pipe; width equal to R P in Fig. 11, and proceed as in circular elbow.

TEA-POT AND TEA-KETTLE SPOUTS.

In laying out tea-pot and tea-kettle spouts, proceed as in Figs. 5 and 12, on page 274, making the width of the rectangles equal to the width of the angle you wish to cut, and the length equal to the circumference of the spout.

SOLID-LIP COFFEE-POT.

Fig. 6.

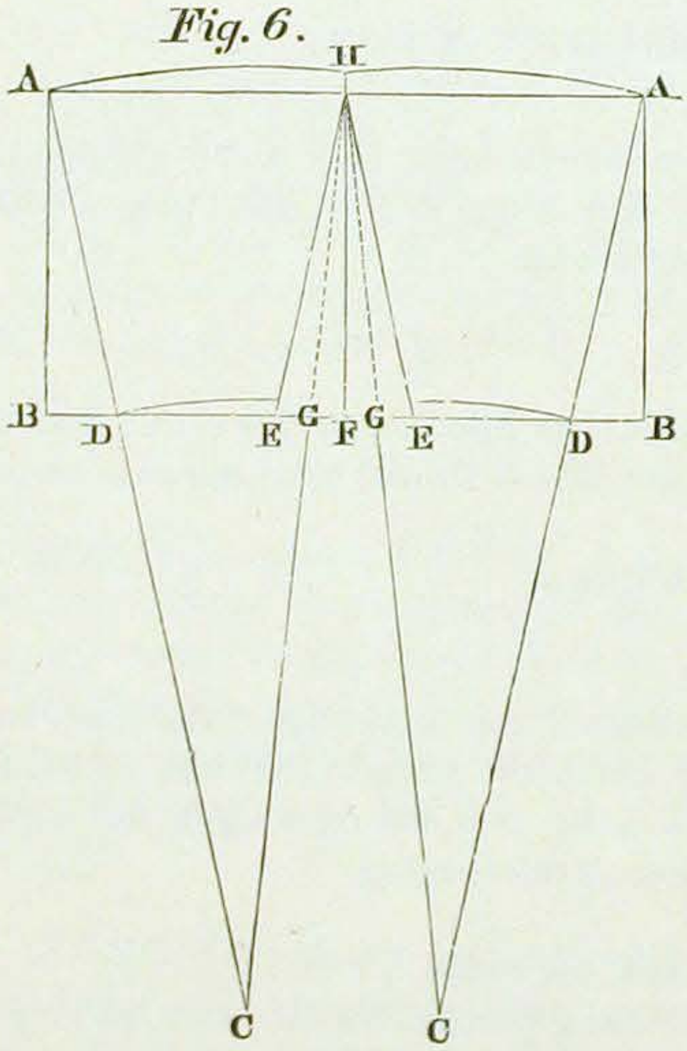
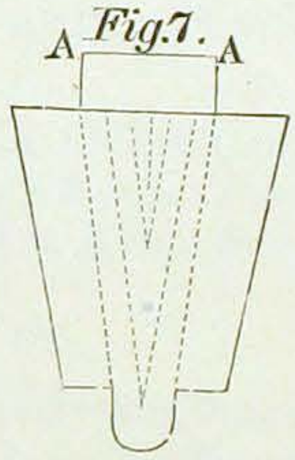


Fig. 7.



Explanation to Figs. 6 and 7.

For the sake of convenience, suppose we wish to construct a solid-lipped coffee-pot in two sections. Construct the rectangle, Fig. 6, A A, equal to one-half the circumference of the large end; A B, the height; draw the line H F; make the distance E E equal to the circumference of the lip; draw the lines H E, H E: make the distance from G to G equal to the width of the lip after it is formed; the distance from G to D equal to one-fourth the circumference of the small end; then from the centre of the line A A draw the lines G C and A D C; from the point C, describe the arcs H A, and from D to the line H E; in forming the lip, place the tin on the hatchet stake, extending along the lines H. C; bend it square, then place it on the blowhorn stake, extending along the line H F; form the lip one-half round, leaving the sides of the lip as far apart as from G to G; construct a piece as represented in Fig. 7, A A, equal in length to G G in Fig. 6; cut the line A A, in Fig. 7, the same curve as the arc D E in Fig. 6; rivet or solder Fig. 7 on the inside of lip as a strainer. The other section is cut the same as Fig. 3 on page 271. Wire on the inside, and allow for edges.

TO CUT A SET OF PATTERNS FOR THE ENVELOPE OF A CONE.

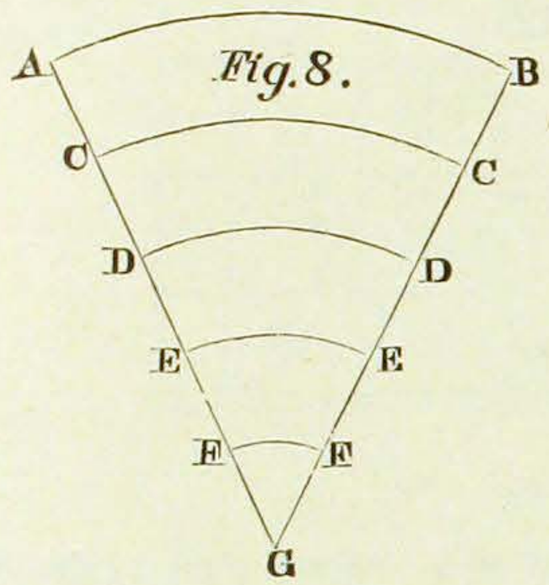


Fig. 8.

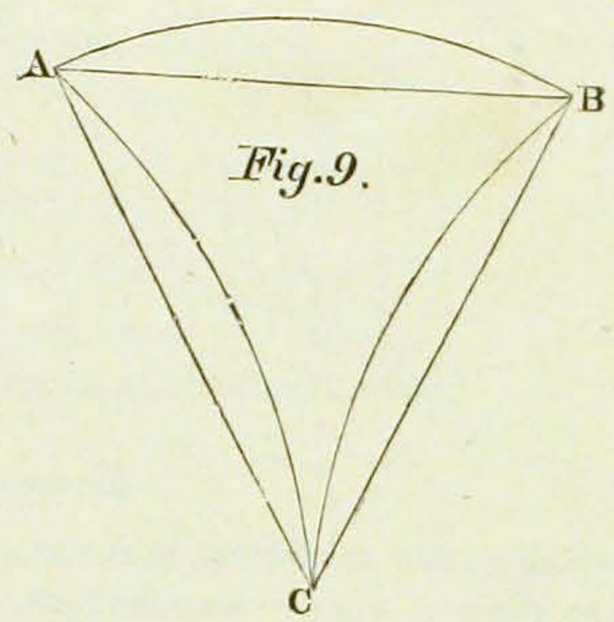


Fig. 9.

Explanation to Fig. 8.

Describe the lines A G and B G; the distance from A to B equal to the circumference of the cone at the large end, A G equal to the slant height; from G as a centre describe the arcs A C, C C, D D, E E, and F F; each of the pieces between these arcs will be a section of the covering; allowance to be made for locks.

TO CUT COFFEE-POT AND STRAINER-BUCKET LIPS.

Explanation to Fig 9.

From the triangle A B C, A B equal to the circumference of the top, C B equal to the slant height; from C describe the arc A B; describe arc from B to C and A to C according to the size of the vessel. For coffee-pots the arc from A to B must be regulated according to the manner in which it is to be formed. [The form here given applies only to the form used in the Eastern States.]

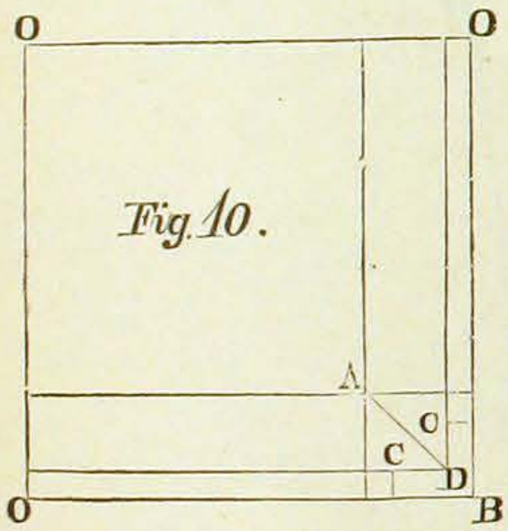


Fig. 10.

DRIPPING PANS.

Explanation to Fig. 10.

To have the corner come up to the wire, let the distance from A to the line B O be the slant height; the distance between the lines E and O B represent the wire; from the line A to the line C the flare; then make the distance from A to E equal to the distance from A to C; this will make the corner sought. To have them a given size, add to the top twice the slant height, and subtract twice the flare.

TO COVER A GLOBE OR EGG-SHAPED BODY.

Describe a semicircle equal in diameter to the globe; place the dividers at the end of the arc, and divide it into any number of equal parts by marking dots on the circle; draw lines across the arc, from dot to dot; distinguish these lines as 1, 2, 3, etc.; divide the figure by placing a line from the top of the arc to the centre of the lower line; form another figure by drawing a perpendicular line equal in length to one-fourth the circumference of the globe; divide it into as many equal parts as there are spaces in the first figure; place the lines 1, 2, 3, etc., (the same length they are in the first figure,) at right angles with the perpendicular, thereby forming the same number of spaces as in the first figure. A curved line drawn touching the points of the lines 1, 2, 3, will give one side of a course. The principle can be applied to covering domes and egg-shaped bodies, by describing one-half the body, and proceeding as before.

ELBOWS FOR HANGING GUTTERS.

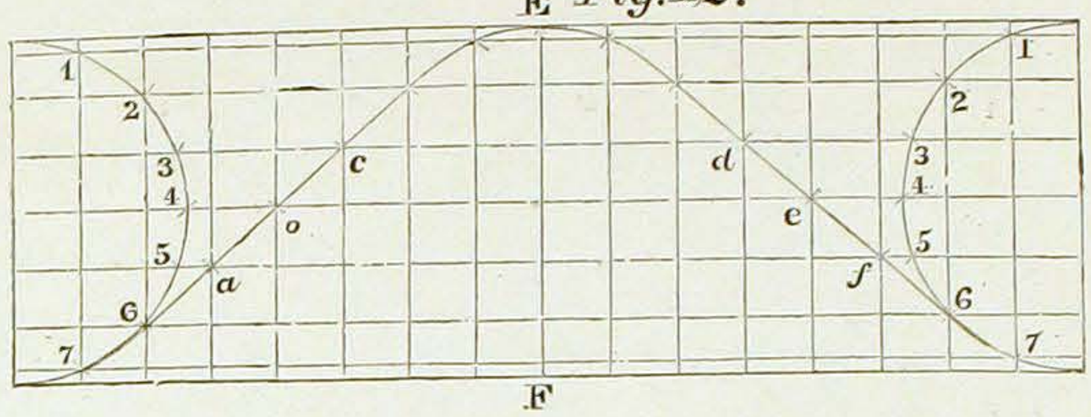


Fig. 12.

Explanation to Fig. 12.

As all hanging gutters are formed in the shape of one-half of a common pipe, by describing one-half of one end of an elbow of a pipe whose diameter is equal to the diameter of the gutter at the top, you have the desired pattern; allowance to be made for bead.

RIGHT-ANGLE ELBOW.

Mark out the length and depth of the elbow; draw a semicircle at each end; divide each semicircle into eight parts; draw horizontal lines as shown from 1 to 1, 2 to 2, etc.; divide the circumference or length into sixteen equal parts, and draw perpendicular lines as in Fig. 12; draw a line from A to B and from B to C, and on the opposite side from D to E and E to F; for the top sweep set the dividers on the *fourth* line from top, and sweep *two* of the spaces; the same at the corner; on space for the remaining sweeps, set the dividers so as to intersect in the three corners of the space marked **X**, The seams must be added to drawing.

OVAL WASH-BOILER COVERS.

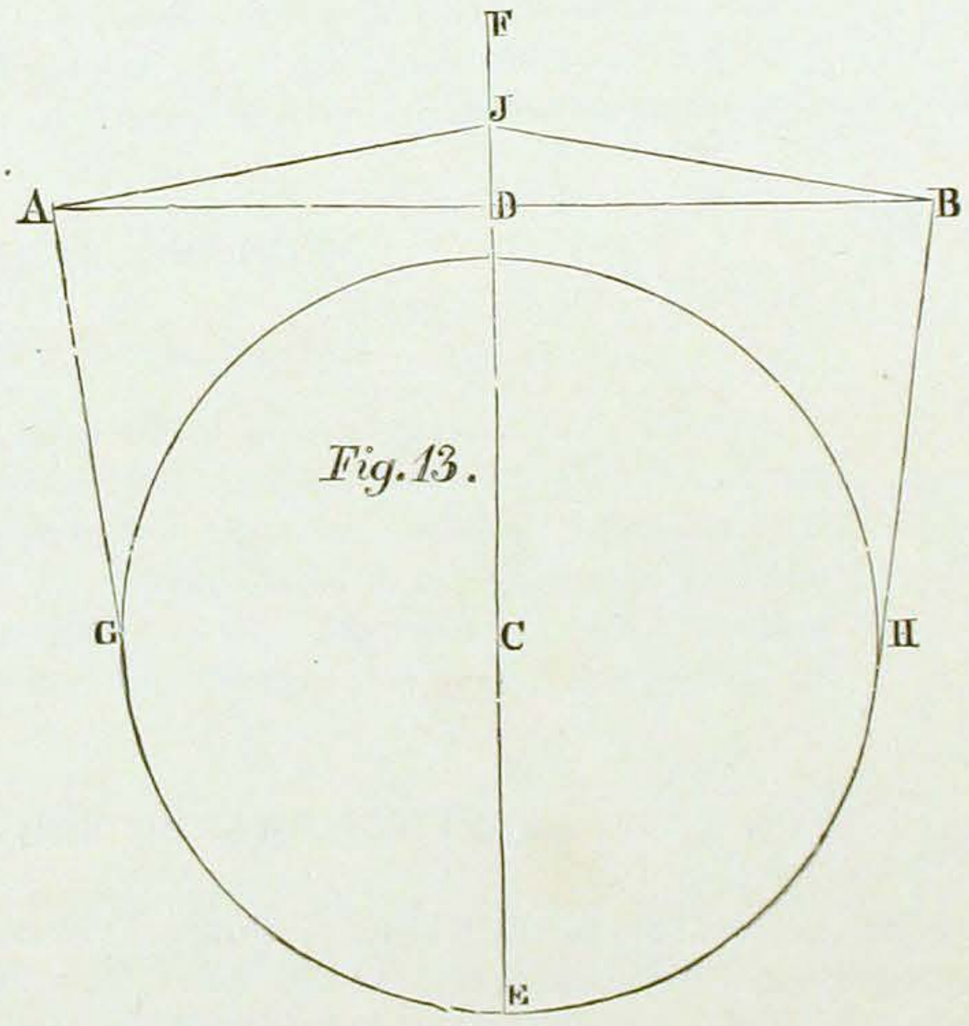


Fig. 13.

Explanation to Fig. 13.

Erect the line D E equal in length to one-half the length of the boiler. From the point C describe the circle H E G equal in diameter to the width of the boiler outside the wire; draw the line A B at right angles with the line D E; make D J one-fourth of an inch or more, as you wish, for the pitch of the cover; place the corner of the square on the line A B, the blade touching the point J; then make the lines A G, A J, J B, and B H, which completes the cover, allowance being made for locks and edges.

TO CUT A PERFECT HEART.

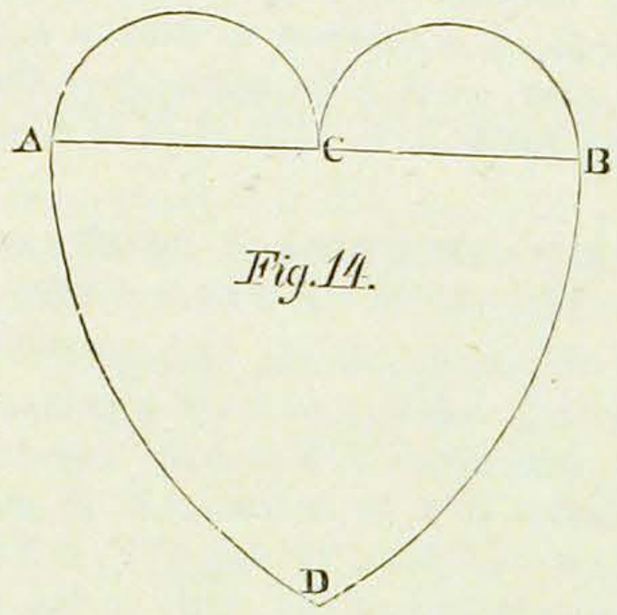


Fig. 14.

Explanation to Fig. 14.

Draw the line A B equal to the width of the heart; describe the semicircles A C and C B; with the dividers spread from A to B describe the arc A D and B D.

LIPS FOR MEASURES.

Describe a circle the size of the top of the measure; draw a line through the centre of the circle, and divide it into four equal parts; spread the dividers three-fourths the diameter of the circle; place the dividers on the line one-fourth the distance from the end, and describe a semicircle touching the other end of the line; move the dividers the width of the lip desired, and describe an arc until it touches the semicircle, which will give the desired lip.

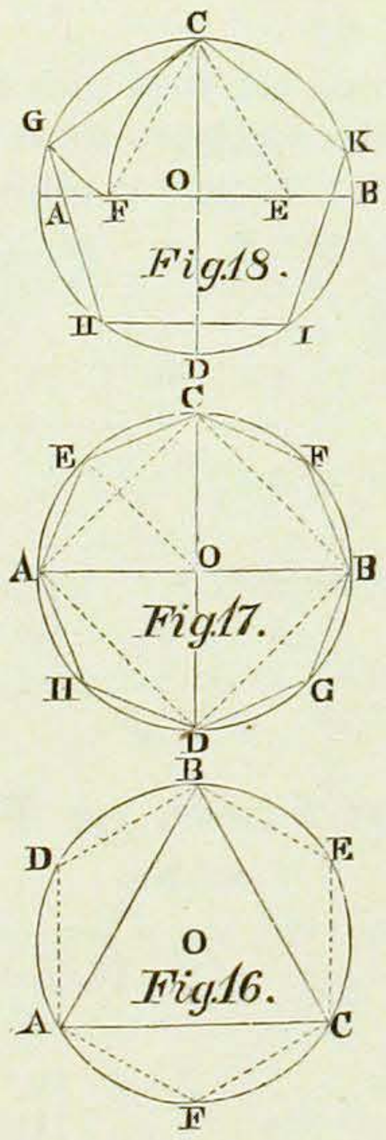


Fig. 18.

Fig. 17.

Fig. 16.

TO INSCRIBE AN EQUILATERAL TRIANGLE WITHIN A GIVEN CIRCLE.

Explanation to Fig. 16.

Let A B C be a circle; it is required to draw within it a triangle whose sides are equal. Commence at the point A; divide the circle into spaces equal to the radius, of which there will be six, and draw the arcs A D, D B, etc.; then on every alternate point, as A B, B C, and the lines will together form an equilateral triangle.

WITHIN A GIVEN CIRCLE TO INSCRIBE A SQUARE.

Explanation to Fig. 17, *page* 275.

Let A B C D be the given circle; it is required to draw a square within it. Draw the diameters A B, C D, at right angles to each other, or, in other words, draw the diameter A B, and form a perpendicular bisecting it. Then join the points A C, C B, B D, D A, and the figure A B C D is a square formed with a given circle.

WITHIN A GIVEN CIRCLE TO INSCRIBE A REGULAR PENTAGON; THAT IS A POLYGON OF FIVE SIDES.

Explanation to Fig. 18, *page* 275.

Let A B C D be a circle in which is required to draw a pentagon: draw a diameter A D, and perpendicular to it another diameter; then divide O B into two equal parts in the point E, and join C E, and with E as a centre, and the radius C E, draw the arc C F, cutting A O in F; and with C as a centre, and the same radius, describe the arc F G; the arcs C F, G F intersect each other in the point F, and the arc, G F intersects the circumference of the circle in the point G. Join the points C and G, and that line will be a side of the pentagon to be drawn. Mark off within the circumference the same space, and join the points A H, H I, I K, K C, and the figure that is formed is a pentagon.

WITHIN A GIVEN CIRCLE TO DESCRIBE A REGULAR HEXAGON; THAT IS TO SAY, A POLYGON OF SIX EQUAL SIDES.

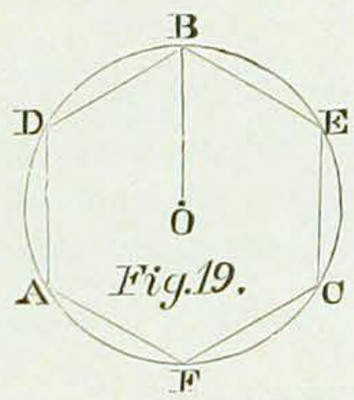


Fig. 19.

Explanation to Fig. 19.

Let A B C be the given circle, and O the centre. With the radius of the circle divide it into parts, of which there will be six, and connect the points A D, D B, etc., and the figure A D B E C F will be a regular hexagon.

We have given the above methods for the benefit of such as wish to lay out their work geometrically. However a polygon of any number of sides can be drawn much easier by dividing the circle into the number of parts desired, and drawing lines from point to point.

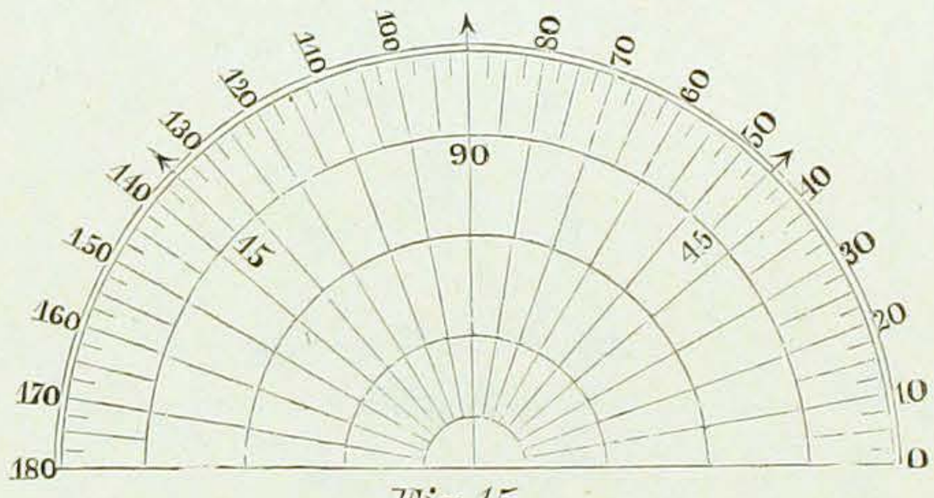


Fig. 15.

Sizes of Tinware in Form of Frustrum of a Cone.

PANS.

Size.	Diameter of top.	Diameter of bottom.	Height.
20 quarts.	19½ inches.	13 inches.	8 inches.
16 "	18 "	11¼ "	6¼ "
14 "	15¼ "	9¼ "	6¼ "
10 "	14¾ "	11 "	4⅛ "
6 "	12¾ "	9 "	4 "
2 "	9 "	6 "	3¾ "
3 pints.	8¼ "	5¾ "	2¾ "
1 "	6¼ "	4 "	2¾ "
Pie.	9 "	7½ "	1¾ "

Sizes of Tinware in Form of Frustrum of a Cone.

DISH KETTLES AND PAILS.

Size.	Diameter of top.	Diameter of bottom.	Height.
14 quarts.	13 inches.	9 inches.	9 inches.
10 "	11½ "	7 "	8 "
6 "	9¼ "	5½ "	6½ "
2 "	6¼ "	4 "	4 "

COFFEE POTS.

Size.	Diameter of top.	Diameter of bottom.	Height.
1 gallon.	4 inches.	7 inches.	8½ inches.
3 quarts.	3½ "	6 "	8½ "

WASH BOWLS.

	Diameter of top.	Diameter of Bottom.	Height.
Large Wash Bowl,	11 inches.	5¾ inches.	5 inches.
Cullender . . .	11 "	5¾ "	5 "
Small Wash Bowls,	9½ "	5½ "	3¾ "
Milk Strainer . .	9½ "	5½ "	3¾ "

DIPPERS.

Size.	Diameter of top.	Diameter of bottom.	Height.
½ gallon.	6½ inches.	4 inches.	4 inches.
1 pint.	4¼ "	3¾ "	2¾ "

MEASURES.

Size.	Diameter of top.	Diameter of bottom.	Height.
1 gallon.	5½ inches.	6⅓ inches.	9¼ inches.
½ "	4 "	4⅞ "	8 "
1 quart.	3½ "	4 "	5¾ "
1 pint.	2⅞ "	3⅛ "	4¼ "
½ "	2⅜ "	2⅞ "	3⅛ "

OIL CAN (from 2½ to 125 gallons) WITH THE QUANTITY AND QUALITY OF TIN REQUIRED FOR CUSTOM WORK.

Gallons.	Quantity and Quality.	Gallons.	Quantity and Quality.
2½	2 plates, I X in body.	33	13½ plates, IX in body, three breadths high.
3½	2 " S D X "		
5½	2 " D X "	45	13½ plates, S D X in body.
8	4 " I X "	60	13½ " D X "
10	3½ " D X "	90	15½ " D X "
15	4 " D X "	125	20 " D X "

CAPACITY OF CANS ONE INCH DEEP.

UTILITY OF TABLE.

Required the contents of a vessel, diameter $6\frac{7}{10}$ inches, depth 10 inches ?

By the table, a vessel one inch deep, and $6\frac{7}{10}$ inches diameter, contains $\frac{15}{100}$ of a gallon, then 15 x 10= 1.50, or one gallon and 2 quarts.

Required the contents of a can, diameter $19\frac{8}{10}$ inches, depth 30 inches ?

By the table, a vessel one inch deep, and $19\frac{8}{10}$ inches diameter, contains $1\frac{33}{100}$ gallons, then 1.33 x 30 = 39.90, or nearly 40 gallons.

Required the depth of a can whose diameter is $12\frac{2}{10}$ inches to contain 16 gallons ?

By the table a vessel one inch deep and $12\frac{2}{10}$ inches diameter contains $\frac{50}{100}$ of a gallon, then 16 ÷ .50 = 32 inches, the depth required, viz. :

.50)16(32 x .50 = 16 gallons.

Diam.		1/10	2/10	3/10	4/10	5/10	6/10	7/10	8/10	9/10
3	.03	.03	.03	.03	.03	.04	.04	.04	.04	.05
4	.05	.05	.05	.05	.06	.06	·07	.07	.07	.08
5	.08	.08	.08	.09	.09	.10	.10	.11	.11	.11
6	.12	.12	.12	.13	.13	.14	.14	.15	.15	.16
7	.16	.17	.17	.18	.18	.19	.19	.20	.20	.21
8	.21	.22	.22	.23	.23	.24	.25	.25	.26	.26
9	.27	.28	.28	.29	.30	.30	.31	.31	.32	.33
10	.34	.34	.35	.36	.36	.37	.38	.38	.39	.40
11	.41	.41	.42	.43	.44	.44	.45	.46	.47	.48
12	.48	.49	.50	.51	.52	.53	.53	.54	.55	.56
13	.57	.58	.59	.60	.60	.61	.62	.63	.64	.65
14	.66	.67	.68	.69	.70	.71	.72	.73	.74	.75
15	.76	.77	.78	.79	.80	.81	.82	.83	.84	.85
16	.87	.88	.89	.90	.91	.92	.93	.94	.95	.97
17	.98	.99	1.005	1.017	1.028	1.040	1.051	1.063	1.075	1.086
18	1.101	1.113	1.125	1.138	1.150	1.162	1.170	1.187	1.200	1.211
19	1.227	1.240	1.253	1.266	1.279	1.292	1.304	1.317	1.330	1.343
20	1.360	1.373	1.385	1.400	1.414	1.428	1.441	1.455	1.478	1.482
21	1.499	1.513	1.527	1.542	1.556	1.570	1.585	1.600	1.612	1.630
22	1.645	1.660	1.675	1.696	1.705	1.720	1.735	1.750	1.770	1.780
23	1.798	1.814	1.830	1.845	1.861	1.876	1.892	1.908	1.923	1.940
24	1.958	1.974	1.991	2.007	2.023	2.040	2.056	2.072	2.096	2.105
25	2.125	2.142	2.159	2.176	2.193	2.210	2.227	2.244	2.261	2.280
26	2.298	2.316	2.333	2.351	2.369	2.386	2.404	2.422	2.440	2.460
27	2.478	2.496	2.515	2.533	2.552	2.570	2.588	2.607	2.625	2.643
28	2.665	2.684	2.703	2.722	2.741	2.764	2.780	2.800	2.820	2.836
29	2.859	2.879	2.898	2.918	2.938	2.958	2.977	2.997	3.017	3.036
30	3.060	3.080	3.100	3.121	3.141	3.162	3.182	3.202	3.223	3.245
31	3.267	3.288	3.309	3.330	3.351	3.372	3.393	3.414	3.436	3.457
32	3.481	3.503	3.524	3.543	3.568	3.590	3.612	3.633	3.655	3.689
33	3.702	3.725	3.747	3.773	3.795	3.814	3.837	3.860	3.882	3.904
34	3.930	3.953	3.976	4.003	4.022	4.046	4.070	4.092	4.115	4.140
35	4.165	4.188	4.212	4.236	4.260	4.284	4.307	4.331	4.355	4.380
36	4.406	4.430	4.455	4.483	4.503	4.528	4.553	4.577	4.602	4.626
37	4.654	4.679	4.704	4.730	4.755	4.780	4.805	4.834	4.855	4.880
38	4.909	4.935	4.961	4.987	5.012	5.038	5.064	5.090	5.120	5.142
39	5.171	5.197	5.224	5.250	5.277	5.304	5.330	5.357	5.383	5.410
40	5.440	5.467	5.491	5.521	5.548	5.576	5.603	5.630	5.657	5.684

VALUABLE PRACTICAL RECEIPTS AND COMPOSITIONS.

Tinsmiths' Solder.—Tin, one pound; lead, one pound.

Plumbers' Solder.—Tin, two pounds; lead, five pounds.

Hard Solder.—Copper, one pound, zinc, eight ounces.

Solder for Gold.—Gold, three pounds; silver, one pound; copper, one pound.

Solder for Silver.—Copper, two pounds; silver, one ounce; sheet brass fifteen pounds.

Solder for Britannia.—Tin, seven pounds; lead, four pounds.

Yellow Solder.—Copper and zinc, equal parts.

Black Solder.—Copper, two pounds; zinc, two pounds; tin, four ounces.

Yellow Brass.—Zinc, ten pounds; lead, four ounces; copper, twenty-four pounds.

Red Brass.—Zinc, five pounds; lead, eight ounces; copper, twenty-four pounds.

Bronze Metal.—Zinc, two pounds; tin, one pound; copper, four pounds.

Britannia Metal.—Antimony, one pound; tin, one hundred pounds; copper, two pounds.

Silver-Colored Metal.—Tin, fifty pounds; bismuth, one pound; antimony three pounds; copper, three pounds.

German Silver—Zinc, five pounds; copper fourteen pounds; nickel, six pounds.

Imitation Silver.—Copper, four pounds; zinc, four ounces.

Pinchbeck.—Zinc, one pound; copper, four pounds.

Tombac.—Tin, one pound; zinc, one pound; copper, fifteen pounds.

White Metal.—Copper, five pounds; zinc three pounds; lead, one pound; tin, one pound.

Metal for taking Impressions.—Bismuth, three pounds; lead, one pound; tin, eight ounces.

Rivet Metal.—Tin, five pounds; zinc, two pounds; copper, ten pounds.

Fusible Alloy (which melts in hot water.)—Bismuth, six ounces; tin, two ounces; lead, three ounces.

A Metal that Extends in Cooling.—Lead, nine parts; antimony, two parts; bismuth, four parts.

Tinning Acid for Brass or Copper.—Muriatic acid, one pound; give it all the zinc it will dissolve; add four ounces sal ammoniac, one pint water.

For Tinning Brass.—Water, four gallons; salt, one pint; cream tartar, one pound.

Mixture for Silvering Metals.—Dissolve two ounces of silver in three grains of corrosive sublimate; add salt, eight quarts; tartaric acid, four pounds.

To Separate Silver from Copper.—Sulphuric acid, one part; nitric acid, one part; water, one part; then boil the metal in the mixture until it dissolves; add a little salt, and the silver will subside.

Speculum Metal.—Copper, four pounds; tin, one pound; zinc, eight ounces.

Common Pewter.—Tin, four pounds; lead, one pound.

Queen's Metal.—Tin, nine pounds; antimony, one pound; lead, one pound; bismuth, one pound.

Mock Platinum.—Copper, four pounds; zinc, eighteen pounds.

Mock Gold.—Copper, sixteen pounds; platinum, seven pounds; zinc, one pound.

Mankin Gold.—Copper, three pounds; zinc, one pound; tin four ounces.

Type Metal.—Lead, nine parts; antimony, two parts; bismuth, two parts; Chinese silver, two and five-tenths parts: copper sixty-five and one-quarter parts; zinc, nineteen and one-half parts; nickel, thirteen parts; cobalt of iron, one-eighth part.

Chinese White.—Copper, forty and four-tenths parts; nickel thirty-one and six-tenths parts; zinc, twenty-five and four-tenths parts; iron, two and six-tenths parts.

Cement for Stopping Holes in Cast-Iron.—Iron filings, fifteen parts; sal ammoniac, two parts; sulphur, one part; ground or powdered stone, two parts; add water until it is about the consistency of common paste; it is then ready for use.

Acid for Soldering Tin.—Muriatic acid, one part; add all the zinc it will dissolve; then add two parts water and a little sal ammoniac.

Acid for Soldering Brass and Copper.—Muriatic acid, one pound; zinc, four ounces; sal ammoniac, five ounces.

Acid for Soldering Zinc.—Muriatic acid, one pound; sal ammoniac, two ounces; all the zinc it will dissolve; water, three pints.

Acid for Soldering Iron.—Muriatic acid, one pound; sperm tallow, six ounces; sal ammoniac, four ounces.

Acid for Soldering Gold and Silver.—Muriatic acid, one pound; sperm tallow eight ounces; sal ammoniac, eight ounces.

Cement for Coppersmiths.—Boiled linseed oil and red lead, mixed to the consistency of putty, is a good cement for stopping joints and cracks in copper pipe.

Cement, Invisible, for Glass, China, Earthen, and Stoneware.—India-rubber, one part; chloroform, sixty parts; white shellac, six parts; gum mastic, twenty parts, shake frequently for two or three days, and it will be ready for use.

Cement for Joining Metals to Wood, Leather, and Glass.—Rosin fifty parts; burnt amber, ten parts calcined plaster, five parts; a little boiled oil improves it.

Cement for Joining Files.—Gum shellac, two parts; powdered chalk, one part; powdered and mixed. Place the cement on one end of the file, heat the other, press them firmly together, and let them cool gradually.

Powder for Silvering Metals.—Nitrate of silver, ten parts; common salt, ten parts; cream tartar, thirty parts; moisten with water, and apply.

Sealing-Wax for Fruit Cans.—Beeswax, one part; rosin, ten parts; gum shellac, one part; coloring according to taste; melt the rosin and beeswax at a low heat, then add the gum shellac, and last of all the coloring. If the cans are to be handled often, less rosin and more beeswax should be used.

A valuable paint for sheet iron or any kind of iron work exposed to the weather is made of varnish, one-half gallon: boiled linseed oil, one-half gallon, and red lead sufficient to bring to the consistency of common paint.

To Coat Brass or Copper Vessels with Tin.—Boil the vessels in a solution of tin filings and chlorate of potassa, and they will in a few minutes become perfectly tinned. Care should be taken to have the vessels perfectly cleaned, otherwise the operation will be imperfectly performed.

To Join Lead Pipes.—One end of the pipe should be enlarged with a round instrument, and then scraped perfectly bright; the other end should be slightly contracted, and likewise scraped; after placing the small within the large end, filling the cavity with solder, it may be made very strong by winding a rag made of seaweed around the pipe immediately below the joint, and pouring on melted solder, which should be smoothed over with a soldering-iron.

To Galvanize with Gold.—Dissolve a little gold in a mixture of muriatic acid and aquafortis, and add to it two parts of alcohol. Copper immersed in this solution for half an hour will be completely galvanized.

Crystallized Tin-plate.—Crystallized tin-plate has a variegated primrose appearance; it is produced upon the surface of tin-plate by applying to it, in a heated state, some diluted nitro-muriatic acid for a few seconds, then washing it with water, drying, and coating it with lacquer. The figures are more or less beautiful and diversified, according to the degree of heat and relative dilution of acid. Place the tin-plate, slightly heated, over a tub of water, and rub its surface with a sponge dipped in a liquor composed of four parts of aquafortis, and two of distilled water, holding one part of common salt or sal ammoniac in solution. Whenever the crystalline spangles seem to be thoroughly brought out, the plate must be immersed in water, washed either with a feather or a little cotton (taking care not to rub off the film of tin that forms the feathering,) forthwith dried with a low heat, and coated with lacquer varnish; otherwise it loses its lustre in the air. If the whole surface is not plunged at once into cold water, but if it be partially cooled by sprinkling water on it, the crystallization will be finely variegated with large and small figures. Similar results will be obtained by blowing cold air through a pipe on the tinned surface, while it is just passing from the fused to the solid state.

Painting Japan Work.—The colors to be painted are tempered, generally in oil, which should have at least one-fourth of its weight of gum sandarach, or mastic, dissolved in it; and it should be well diluted with turpentine, that the colors may be laid on thin and evenly. In some instances it does well to put on water colors or grounds of gold, which a skillful hand can do and manage, so as to make the work appear as if it was embossed. These water colors are best prepared by means of isinglass size, mixed with honey and sugar candy. These colors, when laid on, must receive a number of upper coats of the varnish we have described before.

Japanning Old Tea Trays.—First clean them thoroughly with soap and water, and a little rotten-stone; then dry them by wiping and exposure at the fire. Now get some good copal varnish, mix it with some bronze powder, and apply with brush to the denuded parts. After which set the tea tray in oven, at a heat of 212° or 300°, until the varnish is dry. Two coats will make it equal to new.

Reliable Paste for Sticking on Tin.—To eight ounces flour, four ounces brown sugar, one ounce bi-carb. soda, add five ounces cold water. Mix the above thoroughly until free from lumps. Then add one and one-half pounds boiling water and cook for a short time, continuously stirring. After the paste is made, and while still hot, add one-half ounce sulphuric acid.

To Prevent Rusting.—Boiled linseed oil will keep polished tools from rusting if it is allowed to dry on them. Common sperm oil will prevent them rusting for a short period. A coat of copal is frequently applied to polished tools exposed to the weather.

New Tinning Process.—The articles to be tinned are first covered with dilute sulphuric acid, and when quite clean, are placed in warm water, then dipped into solution of muriatic acid, copper, and zinc, and then plunged into a tin-bath, to which a small quautity of zinc has been added. When the tinning is finished, the articles are taken out and plunged into boiling water. The operation is completed by placing them in very warm sand-bath. The last process softens the iron.

Kustitien's Metal for Tinning.—Malleable iron, one pound; heat to whiteness; add five ounces regulus of antimony, and malacca tin, twenty-four pounds.

Cement for Holes for Castings.—The best cement for this purpose is made by mixing one part of sulphur in powder, two parts of sal ammoniac, and eighty parts of clean powdered iron turnings. Sufficient water must be added to make it into a thick paste, which should be pressed into the holes or seams which are to be filled up. The ingredients composing this cement should be kept separate, and not mixed until required for use. It is to be applied cold, and the casting should not be used for two or three days afterwards.

Plumbers' Cement.—Plumbers' cement consists of black rosin, one part; brickdust, two parts; well incorporated by a melting heat.

Cement to Mend Iron Pots and Pans.—Take two parts of sulphur, and one part, by weight, of fine black lead; put the sulphur in an old iron pan, holding it over the fire until it begins to melt; then add the lead; stir well until all is mixed and melted; then pour out on an iron plate, or smooth stone; when cool, break into small pieces. A sufficient quantity of this compound being placed upon the crack of the iron pot to be mended, can be soldered by a hot iron in the same way as a tinsmith solders his sheets. If there is a small hole in the pot, drive a copper rivet in it, and then solder it over with this cement.

Japanning and Varnishing.—All surfaces to be japanned must be perfectly clean. Leather should be stretched on frames; paper should be stiff for japanning.

The French prime all their japanned articles; the English do not. This priming is generally of common size. Those articles that are primed thus never endure as well as those that receive the japan coating on the first operation, and thus it is that those articles of japan work that are primed with size when they are used for some time crack, and the coats of japan fly off in flakes.

A solution of strong isinglass size and honey, or sugar candy, makes a good japan varnish to cover water colors on gold grounds.

A pure white priming for japanning, for the cheap method, is made with parchment size, and one-third of isinglass, laid on very thin and smooth. It is the better for three coats, and when the last coat is dry, it is prepared to receive the painting or figures. Previous to the last coat, however, the work should be smoothly polished. When wood or leather is to be japanned, and no priming used, the best plan is to lay on two or three coats of varnish, made of seed-lac and resin, two ounces each, dissolved in alcohol, and strained through a cloth. This varnish should be put on in a warm place, and the work to be varnished should, if possible, be warm also, and all dampness should be avoided, to prevent the varnish from

being chilled. When the work is prepared with this composition, and dry, it is fit for the proper japan to be laid on. If the ground is not to be white, the best varnish now to be used is made of shellac, as it is the best vehicle for all kinds of colors. This is made in the proportions of the best shellac; five ounces, made into powder, steeped in a quart of alcohol, and kept at a gentle heat for two or three days, and shaken frequently, after which the solution must be filtered through a flannel bag, and kept in a well-corked bottle for use. This varnish for hard japanning on *copper* or *tin*, will stand forever, unless fire or hammer be used to burn or beetle it off.

The color to be used with shellac varnish may be of any pigments whatever to give the desired shade, as this varnish will mix with any color.

White Japanned Grounds.—To form a hard, perfect white ground is no easy matter, as the substances which are generally used to make the japan hard, have a tendency, by a number of coats, to look or become dull in brightness. One white ground is made by the following composition: White flake or lead, washed over and ground up with a sixth of its weight of starch; then dried and mixed up with the finest gum, ground up in parts one ounce gum, to half an ounce of rectified turpentine, mixed and ground thoroughly together. This is to be finely laid on the article to be japanned, dried, and then varnished with five or six coats of the following: two ounces of the whitest seed-lac to three ounces of gum anime, reduced to a fine powder, and dissolved in a quart of alcohol. This lac must be carefully picked. For a softer varnish than this, a little turpentine should be added, and less of the gum. A very good varnish, and not brittle, may be made by dissolving gum anime in nut oil, boiling it gently as the gum is added, and giving the oil as much gum as it will take up. The ground of white varnish may, of itself, be made of this varnish, by giving two or three coats of it, but when used it should be diluted with pure turpentine. Although this varnish is not brittle, it is liable to be indented with strokes, and will not bear to be polished; but if well laid on, it will not need polishing afterwards; it also takes some time to dry. Heat applied to all oils, however, darkens their color, and oil varnishes for white grow very yellow if not exposed to a full, clear light.

Gum Copal.—Copal varnish is one of the very finest varnishes for japanning purposes. It can be dissolved by linseed oil, rendered dry by adding some quicklime at a heat somewhat less than will boil or decompose the oil by it.

This solution, with the addition of a little turpentine, forms a very transparent varnish, which, when properly applied and slowly dried, is very hard and durable. This varnish is applied to snuff-boxes, tea-boards, and other utensils. It also preserves paintings, and renders their surfaces capable of reflecting light more uniformly.

If powdered copal be mixed in a mortar with camphor, it softens and becomes a coherent mass; and if camphor be added to alcohol, it becomes an excellent solvent of copal by adding the copal, well ground, and emplaying a tolerable degree of heat, having the vessel well corked, which must have a long neck for the allowance of expansion; and the vessel must only be about one-fourth filled with the mixture. Copal can also be incorporated with turpentine, with one part of powdered copal to twelve parts of pure turpentine, subjected to the heat of a sand-bath for several days in a long-necked matrass, shaking it frequently.

Copal is a good varnish for metals, such as *tin*. The varnish must be dried in an oven, each coat, and it can be covered with some substances, but alcohol varnish will mix with any coloring matter. For white japans and varnishes, we have already shown that fine chalk or white lead was used as a basis, and the varnishes coated over it.

To japan or varnish white leather, so that it may be elastic, is altogether a different work from varnishing or japanning wood or metal, or papier-maché.

For white leather, oil is the principal ingredient, as it is well known that chalk is extensively used to give white leather its pure color; or, speaking more philosophically, its fair, colorless whiteness. White leather having already the basis of white varnish, it should get a light coat of the pure varnish, before mentioned, and dried well, *in the oven*, or a coat of the oil copal will answer very well. This being well dried, boiled nut oil, nicely coated and successively dried, will make a most beautiful white varnish for leather, not liable to crack. This quality takes a long time to dry, and, of course, is more expensive. Coarse varnish may be made of boiled linseed oil, into which is added gradually the acetate of lead as a drier. This addition must be done very cautiously, as the oil will be apt to foam over.

A better and more safe drying mixture than the mere acetate of lead is to dissolve the acetate of lead in a small quantity of water, neutralize the acid with the addition of pipe-clay, evaporate the sediment to perfect dryness, and feed the oil, when gently boiling, gradually with it.

These *varnishes* or *japans*, as far as described, have only reference to white grounds.

There is some nice work to be observed, and there is much in applying the varnishes at the right time, knowing by the eye the proper moment when the mixture is perfect, or when to add any ingredient. These things require practice.

Black Grounds.—Black grounds for japans may be made by mixing ivory-black with shellac-varnish; or, for coarse work, lampblack and the top coating of common seed-lac varnish. A common black japan may be made by painting a piece of work with drying oil (oil mixed with lead), and putting the work into the stove, not too hot, but of such a degree, gradually raising the heat and keeping it up for a long time, so as not to burn the oil and make it blister. This process makes very fair japan, and requires no polishing.

Black Japan.—Naples asphaltum, fifty pounds, dark gum-anime, eight pounds; fuse; add linseed oil, twelve gallons; boil; add dark gum-amber, ten pounds, previously fused and boiled with linseed oil, two gallons, add the driers and proceed as last. Used for wood or metals.

Brunswick Black.—1. Foreign asphaltum, forty-five pounds; drying oil, six gallons; litharge, six pounds; boil as last, and thin with twenty-five gallons of oil of turpentine. Used for iron work, etc. 2. Black pitch and gas tar asphaltum, of each twenty-five pounds; boil gently for five hours; then add linseed oil, eight gallons; litharge and red lead, of each ten pounds; boil as before, and thin with oil of turpentine, twenty gallons. Inferior to the last, but cheaper.

Blue Japan Grounds.—Blue japan grounds may be formed of bright Prussian blue. The color may be mixed with shellac varnish, and brought to a polishing state by five or six coats of varnish of seed-lac. The varnish, however, is apt to give a greenish tinge to the blue, as the varnish has a yellowish tinge, and blue and yellow form a green. Whenever a light blue is desired, the purest varnish must always be used.

Scarlet Japan.—Ground vermilion may be used for this, but, being so glaring, it is not beautiful unless covered over with rose-pink or lake, which have a good effect when thus used. For a very bright crimson ground, safflower or Indian lake should be used, always dissolved in the alcohol of which the varnish is made. In place of this lake, carmine may be used, as it is more common. The top coat of varnish must always be of the white seed-lac, which has been before described, and as many coats given as will be thought proper. It is easy to judge of this.

Yellow Grounds.—If tumeric be dissolved in the spirit of wine, and strained through a cloth, and then mixed with pure seed-lac varnish, it makes a good yellow japan. Saffron will answer for the same purpose in the same way; but the brightest yellow ground is made by a primary coat of pure chrome yellow, and coated successively with the varnish.

Dutch pink is used for a kind of cheap yellow japan ground. If a little dragon's blood be added to the varnish of yellow japan, a most beautiful and rich salmon-colored varnish is the result; and by these two mixtures all the shades of flesh colored japan are produced.

Green Japan Grounds.—A good green may be made by mixing Prussian blue along with the chromate of lead, or with the tumeric, or orpiment (sulphuret of arsenic),or ochre, only the two should be ground together and dissolved in alcohol, and applied as a ground, then coated with four or five coats of shellac varnish in the manner already described. A very bright green is made by laying on a ground of Dutch metal, or leaf of gold, and then coating it over with distilled verdigris dissolved in alcohol, then the varnish on the top. This is a splendid green, brilliant and glowing.

Orange-Colored Grounds.—Orange grounds may be made of yellow mixed with vermilion or carmine, just as a bright or rather inferior color is wanted. The yellow should always be in quantity to make a good full color, and the red added in proportion to the depth of shade. If there is not a good full body of yellow the color will look watery, or bare, as it is technically termed.

Purple Japan Grounds.—This is made by a mixture of lake and Prussion blue, or carmine, or, for an inferior color, vermilion, and treated as the foregoing. When the ground is laid on and perfectly dried, a fine coat of pure boiled nut oil, then laid on and perfectly dried, is a good method to have a japan not liable to crack. But a better plan is to use this oil in the varnish given, the first coat after the ground is laid on, and which should contain considerable of pure turpentine. In every case where oil is used for any purpose for varnish, it is all the better if turpentine is mixed with it. Turpentine enables oil to mix with either alcohol or water. Alkalies have this property also.

Black Japan.—1. Asphaltum, three ounces; boiled oil, four quarts; burnt umber, eight ounces. Mix by heat, and, when cooling, thin with turpentine. 2. Amber, twelve ounces; asphaltum, two ounces.

Fuse by heat; add boiled oil, half a pint; resin, two ounces; when cooling add sixteen ounces oil of turpentine. Both are used to varnish metals.

Japan Black for Leather.—1. Burnt umber, four ounces; true asphaltum, two ounces; boiled oil, two quarts. Dissolve the asphaltum by heat in a little of the oil, add the burnt umber, ground in oil, and the remainder of the oil mix, cool, and thin with turpentine. Flexible. 2. Shellac, one part; wood naphtha, four parts; dissolve and color with lampblack. Inflexible.

Transparent Japan.—Oil of turpentine, four ounces; oil of lavender, three ounces; camphor, one-half drachm; copal, one ounce. Dissolve. Used to japan tin, but quick copal varnish is mostly used instead.

Japanner's Copal Varnish.—Pale African copal, seven pounds; fuse; add clarified linseed oil, one-half gallon; boil for five minutes; remove it into the open air; add boiling oil of turpentine, three gallons; mix well, strain it into the cistern, and cover it up immediately. Used to varnish furniture, and by japanners, coachmakers, etc. Dries in fifteen minutes, and may be polished as soon as hard.

Tortoise Shell Varnish.—This varnish is prepared by taking of good linseed oil one gallon, and of umber half a pound, and boiling them together until the oil becomes very brown and thick, when they are strained through a cloth and boiled again, until the composition is about the consistence of pitch, when it is fit for use. Having prepared this varnish, clean well the copper or iron plate, or vessel that is to be varnished (japanned), and then lay vermilion, mixed with shellac varnish, or with drying oil, diluted with turpentine, very thinly, on the places intended to imitate the clear parts of the tortoise shell. When the vermilion is dry brush over the whole with the above umber varnish diluted to a due consistence with tupentine; and when it is set and firm it must be put into a stove and undergo a strong heat for a long time; even two weeks will not hurt it. This is the ground for those beautiful snuff-boxes and tea-boards which are so much admired; and these grounds can be decorated with all kinds of paintings that fancy may suggest, and the work is all the better to be finished in an annealing oven.

Japan Finishing.—The finishing part of japanning lies in laying on and polishing the outer coats of varnish, which is necessary in all painted or simply ground colored japan work. When brightness and clearness are wanted, the white kind of varnish is necessary, for seed-lac varnish, which is the hardest and most tenacious, imparts a yellow tinge. A mixed varnish, we believe, is the best for this purpose; that is, for combining hardness and purity; Take, then, three ounces of seed-lac, picked very carefully from all sticks and dirt, and washing it well with cold water, stirring it up, pouring it off, and continuing the process until the water runs off perfectly pure. Dry it, and then reduce it to powder, and put it, with a pint of pure alcohol, into a bottle, of which it must occupy only two-thirds of its space. This mixture must be shaken well together, and the bottle kept at a gentle heat (being corked), until the lac be dissolved. When this is the case the clear must be poured off, and the remainder strained through a cloth, and all the clear, strained and poured, must be kept in a well-stopped bottle. The manner of using this seed-lac varnish is the same as that before described, and a fine polishing varnish is made by mixing this with the pure white varnish. The pieces of work to be varnished for finishing should be placed near a stove, or in a warm, dry room, and one coat should be perfectly dry before the other is applied. The varnish is applied by proper brushes, beginning at the middle, passing the stroke to one end, and with the other, stroke from the middle to the other end. Great skill is displayed in laying on these coats of varnish. If possible, the skill of hand should never cross, or twice pass over, in giving one coat. When one coat is dry, another must be laid over it, and so on successively for a number of coats, so that the coating should be sufficiently thick to stand fully all the polishing, so as not to bear the surface of the colored work. When a sufficient number of coats are thus laid on, the work is fit to be polished, which, in common cases, is commenced with a rag dipped in finely-powdered rotten stone, and towards the end of the rubbing, a little oil should be used along with the powder; and when the work appears fine and glossy a little oil should be used alone to clean off the powder and give the work a still brighter hue. In very fine work, French whiting should be used, which should be washed in water to remove any sand that might be in it. Pumice-stone, ground to a very fine powder, is used for the first part of the polishing, and the finishing done with whiting. It is always best to dry the varnish of all japan work by heat. For wood work heat must be sparingly used; but for metals, the varnish should be dried in an oven; also for papier-maché and leather. The metal will stand the greatest heat, and care must be taken not to darken by too high a temperature. When gold size is used in gilding for japan work, where it is desired not to have the gold shine, or appear burnished, the gold size should be used with a little of the spirits of turpentine and a little oil; but when a

considerable degree of lustre is wanted, without burnishing, and the preparation necessary for it, a little of the size along with oil alone should be used.

VARNISHES.—Different substances are employed for making varnish, the object being to produce a liquid easily applied to the surface of cloth, paper, or metal, which, when dry, will protect it with a fine skin. Gums and resins are the substances employed for making varnishes. They are dissolved either in turpentine, alcohol, or oil in a close stoneware, glass, or metal vessel, exposed to a low heat, as the case may require, or cold. The alcohol or turpentine dissolves the gum or resin, and holds them in solution; and after the application of the varnish, this mixture being mechanical, the moisture of the liquid evaporates, and the gum adheres to the article to which it is applied.

The choice of linseed oil is of peculiar consequence to the varnish-maker. Oil from fine, full-grown, ripe seed, when viewed in a vial, will appear limpid, pale, and brilliant; it is mellow and sweet to the taste; has very little smell; is specifically lighter than impure oil; and when clarified, dries quickly and firmly, and does not materially change the color of the varnish when made, but appears limpid and brilliant.

The chief resins employed in the manufacture of varnishes—"*Amber*," "*Anime*," "*Benzoin*," "*Colophony*," "*Copal.*"

AMBER.—This resin is the most distinguished for durability. It is usually of some shade of yellow; transparent, hard, and moderately tough. Heated in air, it fuses at about 549°; it burns with a clear flame, emitting a pleasant odor.

ANIME.—This is imported from the East Indies. The large, transparent, pale yellow pieces, with vitreous fracture, are best suited for varnish. Inferior qualities are employed for manufacturing gold-size or japan black. Although superior to amber in its capacity for drying, and equal in hardness, varnish made from anime deepens in color on exposure to air, and is very liable to crack. It is, however, much used for mixing with copal varnish.

BENZOIN.—This is a gum resin but little used in varnishes, on account of its costliness.

COLOPHONY.—This resin is synonymous with arcanson and rosin. When the resinous juice of *Pinus sylvestris* and other varieties if distilled, colophony remains in the retort. Its dark color is due to the action of the fire. Dissolved in linseed oil, or in turpentine, by the aid of heat, colophony forms a brilliant, hard, but brittle, varnish.

COPAL.—This is a gum resin of immense importance to the varnish-maker. It consists of several minor resins of different degrees of solubility.

USEFUL ARITHMETICAL RULES AND VALUABLE INFORMATION.

To find the Contents in Gallons of any Square Vessel.—Take the dimensions in inches, and decimal parts of an inch; multiply the length, breadth, and height together, and then multiply the product by .004329 for Wine gallons, and by .003546 for Ale gallons.

To find the Contents in Gallons of any Cylindrical Vessel.—Take the dimensions in inches and decimal parts of an inch; square the diameter; multiply it by the length in inches, and then multiply the product by .0034 for Wine gallons, and by .002785 for Ale gallons.

To find the contents of a Flaring Vessel.—Square the diameter of the top and bottom; add them together, and divide product by 2; then multiply the quotient by the height.

To find the Circumference of a Circle. Multiply the diameter by 3.1416.

To find the Diameter of a Circle.—Divide the circumference by 3.1416.

To find the Area of a Circle.—Multiply the circumference by one-fourth the diameter.

To find the Circumference of an Oval.—Multiply one-half the sum of the two diameters by 3.1416.

To find the Area of an Oval.—Multiply the diameters together, and that product by .7854.

To find the Area of a Sector of a Circle.—Multiply the length of the arc by half the length of the radius.

To find the Area between two Circles having the same Centre.—Multiply the sum of the inside and outside diameters by their difference, and by the decimal .7854.

To find the Area of a regular Polygon of any number of sides.—Multiply the square of one-half the distance from the middle of the side to the centre of the polygon, and that product by the number of sides.

To find the Diameter or Circumference of a Circle, the Area being known.—Divide the area by 3.1416; the square root of the quotient will be equal to half the diameter; and the diameter multiplied by 3.1416 will equal the circumference.

To find the Side of a Square that shall equal the Area of a Circle of a given Diameter or Circumference. Multiply the diameter of the circle by .886227; or multiply the circumference of the circle by .282094.

To find the Diameter of a circle that shall contain the Area of a given square.—Multiply the side of the given square by 1.12838.

To find the Side of the largest Square that can be inscribed in a Circle of a given Diameter or Circumference.—Multiply the given diameter by .707106; or multiply the given circumference by .225079.

To find the Circumference of a Circle required to exactly admit a Square of a given side.—Divide the given side by .225079.

To find the Side of the largest Equilateral Triangle that can be inscribed in a given Circle of a Diameter or Circumference.—Multiply the given diameter by .866025; or the circumference by .275664.

To find the Surface of a Prism or of a Cylinder.—Multiply the perimeter by the height, and to the product add the area of the two ends.

To find the Contents of a Prism or of a Cylinder.—Multiply the area of the base by the height.

To find the Surface of a Pyramid or of a Cone.—Multiply the perimeter or circumference of the base by half of the slant height, and to the product add the area of the base.

To find the Contents of a Pyramid or of a Cone.—Multiply the area of the base by one-third the height.

To find the Surface of a Frustum of a Pyramid or of a Cone.—Multiply the sum of the perimeters, or of the circumference of the two ends, by half of the slant height, and to the product add the area of the two ends.

To find the Contents of a Frustrum of a Pyramid or of a Cone.—Multiply the areas of two ends together, and extract the square root of the product; to this root add the two areas, and multiply their sum by one-third of the altitude.

To find the Surface of a Sphere.—Multiply the diameter by the circumference.

To find the Contents of a Sphere.—Multiply the cube of the diameter by .523598.

To find the Area of a Triangle.—Multiply the base by half the height.

To find the Area of a Parallelogram.—Multiply the base by the height.

To find the Area of a Trapezoid.—Multiply half of the sum of the parallel sides by the height.

To find the Area of a Trapezium.—Divide the trapezium into two triangles by a diagonal; find the areas of these triangles; their sum will be the area of the trapezium.

Weight of Wrought Iron, Steel, Copper, and Brass Plates.

Soft Rolled—Thickness determined by American Gauge. Per Square Foot.

No. of Gauge.	Thickness of each Number.	Wrought Iron.	Steel.	Copper.	Brass.	No. of Gauge.	Thickness of each Number.	Wrought Iron.	Steel.	Copper.	Brass.
	Inch.	Lbs.	Lbs.	Lbs.	Lbs.		Inch.	Lbs.	Lbs.	Lbs.	Lbs.
0000	.46	18.4575	18.7036	20.838	19.688	14	.064084	2.5714	2.6057	2.903	2.7428
000	.40964	16.4368	16.6559	18.5567	17.5326	15	.057068	2.2899	2.3204	2.5852	2.4425
00	.3648	14.6376	14.8328	16.5254	15.6134	16	.05082	2.0392	2.0664	2.3021	2.1751
0	.32486	13.0351	13.2088	14.7162	13.904	17	.045257	1.8159	1.8402	2.0501	1.937
1	.2893	11.6082	11.7629	13.1053	12.382	18	.040303	1.6172	1.6387	1.8257	1.725
2	.25763	10.3374	10.4752	11.6706	11.0266	19	.03589	1.44	1.4593	1.6258	1.5361
3	.22942	9.2055	9.3283	10.3927	9.8192	20	.031961	1.2824	1.2995	1.4478	1.3679
4	.20431	8.1979	8.3073	9.2552	8.7445	21	.028462	1.142	1.1573	1.2893	1.2182
5	.18194	7.3004	7.3977	8.2419	7.787	22	.025347	1.017	1.0306	1.1482	1.0849
6	.16202	6.5011	6.5878	7.3395	6.9345	23	.022571	.9057	.9177	1.0225	.96604
7	.14428	5.7892	5.8664	6.5359	6.1752	24	.0201	.8065	.8173	.91053	.86028
8	.12849	5.1557	5.2244	5.8206	5.4994	25	.0179	.7182	.7278	.81087	.76612
9	.11443	4.5915	4.6527	5.1837	4.8976	26	.01594	.6396	.6481	.72208	.68223
10	.10189	4.0884	4.1428	4.6156	4.3609	27	.014195	.5696	.5772	.64303	.60755
11	.090742	3.641	3.6896	4.1106	3.8838	28	.012641	.5072	.514	.57264	.54103
12	.080808	3.2424	3.2856	3.6606	3.4586	29	.011257	.4517	.4577	.50994	.4818
13	.071961	2.8874	2.9259	3.2598	3.0799	30	.010025	.4023	.4076	.45413	.42907

Weight of Wrought Iron, Steel, Copper, and Brass Wire.

Diameters determined by American Gauge. Per Lineal Foot.

No. of Gauge.	Diameter of each Number.	Wrought Iron.	Steel.	Copper.	Brass.	No. of Gauge.	Diameter of each Number.	Wrought Iron.	Steel.	Copper.	Brass.
	Inch.	Lbs.	Lbs.	Lbs.	Lbs.		Inch.	Lbs.	Lbs.	Lbs.	Lbs.
0000	.46	.56074	.56603	.640513	.605176	14	.064084	.010886	.010989	.012435	.011746
000	.40964	.444683	.448879	.507946	.479908	15	.057068	.008631	.008712	.009859	.009315
00	.3648	.352659	.355986	.40283	.380666	16	.05082	.006845	.006909	.007819	.007587
0	.32486	.279665	.282303	.319451	.301816	17	.045257	.005427	.005478	.006199	.005857
1	.2893	.221789	.223891	.253342	.239353	18	.040303	.004304	.004344	.004916	.004645
2	.25763	.175888	.177548	.200911	.189818	19	.03589	.003413	.003445	.003899	.003684
3	.22942	.13948	.140765	.159323	.150522	20	.031961	.002708	.002734	.003094	.00292
4	.20431	.110616	.11166	.126353	.119376	21	.028462	.002147	.002167	.002452	.002317
5	.18194	.08772	.088548	.1002	.094666	22	.025347	.001703	.001719	.001945	.001838
6	.16202	.069565	.070221	.079462	.075075	23	.022571	.00135	.001363	.001143	.001457
7	.14428	.055165	.055685	.063013	.059545	24	.0201	.001071	.001081	.001223	.001155
8	.12849	.043751	.044164	.049976	.047219	25	.0179	.0008491	.0008571	.0009699	.0009163
9	.11443	.034699	.035026	.039636	.037437	26	.01594	.0006734	.0006797	.0007692	.0007267
10	.10189	.027512	.027772	.031426	.029687	27	.014195	.000534	.0005391	.0006099	.0005763
11	.090742	.02182	.022026	.024924	.023549	28	.012641	.0004235	.0004275	.0004837	.000457
12	.080808	.017304	.017468	.019766	.018676	29	.011257	.0003358	.0003389	.0003835	.0003624
13	.071961	.013722	.013851	.015674	.014809	30	.010025	.0002663	.0002688	.0003042	.0002874

Weights of Wrought Iron, Steel, Copper, and Brass Plates.

Soft Rolled—Thickness determined by Birmingham Gauge. Per Square Foot.

No. of Gauge.	Thickness of each Number.	Wrought Iron.	Steel.	Copper.	Brass.	No. of Gauge.	Thickness of each Number.	Wrought Iron.	Steel.	Copper.	Brass.
	Inches.	Lbs.	Lbs.	Lbs.	Lbs.		Inches.	Lbs.	Lbs.	Lbs.	Lbs.
0000	.454	18.2167	18.4596	20.5662	19.4312	14	.083	3.3304	3.3748	3.7599	3.5524
000	.425	17.0531	17.2805	19.2525	18.19	15	.072	2 889	2.9275	3.2616	3.0816
00	.38	15.2475	15 4508	17.214	16.264	16	.065	2.6081	2.6429	2.9445	2.782
0	.34	13.6425	13.8244	15.402	14.552	17	.058	2.3272	2 3583	2.6274	2.4824
1	.3	12.0375	12.198	13.59	12.84	18	.049	1.9661	1.9923	2.2197	2.0972
2	.284	11.3955	11.5474	12.8652	12.1552	19	.042	1.6852	1.7077	1.9026	1.7976
3	.259	10.3924	10.5309	11.7327	11.0852	20	.035	1.4044	1.4231	1.5855	1.498
4	.238	9 5497	9.6771	10.7814	10.1864	21	.032	1.284	1.3011	1.4496	1.3696
5	.22	8.8275	8.9452	9.966	9.416	22	.028	1.1235	1.1385	1.2684	1.1984
6	.203	8.1454	8.254	9.1959	8.6884	23	.025	1.0031	1.0165	1.1325	1.07
7	.18	7.2225	7.3188	8.154	7.704	24	.022	.8827	.8945	.9966	.9416
8	.165	6.6206	6.7089	7.4745	7.062	25	.02	.8025	.8132	.906	.856
9	.148	5.9385	6.0177	6.7044	6.3344	26	.018	.7222	.7319	.8154	.7704
10	.134	5.3767	5.4484	6.0702	5.7352	27	.016	.642	.6506	.7248	.6848
11	.12	4.815	4.8792	5.436	5.136	28	.014	.5617	.5692	.6342	.5992
12	.109	4.3736	4.4319	4.9377	4.6652	29	.013	.5216	.5286	.5889	.5564
13	.095	3.8119	3.8627	4.3035	4.066	30	.012	.4815	.4879	.5436	.5136

Weights of Wrought Iron, Steel, Copper, and Brass Wire.

Diameters determined by Birmingham Gauge. Per Lineal Foot.

No. of Gauge.	Diameter of each Number.	Wrought Iron.	Steel.	Copper.	Brass.	No. of Gauge.	Diameter of each Number.	Wrought Iron.	Steel.	Copper.	Brass.
	Inch.	Lbs.	Lbs.	Lbs.	Lbs.		Inch.	Lbs.	Lbs.	Lbs.	Lbs.
0000	.454	.546207	.55136	.623913	.589286	14	.083	.018256	.018428	.020853	.019696
000	.425	.478656	.483172	.546752	.516407	15	.072	.013738	.013867	.015692	.014821
00	.38	.38266	.38627	.437099	.41284	16	.065	.011196	.011302	.012789	.012079
0	.34	.30634	.30923	.349921	.3305	17	.058	.008915	.008999	.010183	.009618
1	.3	.2385	.24075	.27243	.25731	18	.049	.006363	.006423	.007268	.006864
2	.284	.213738	.215755	.244146	.230596	19	.042	.004675	.004719	.00534	.005043
3	.259	.177765	.179442	.203054	.191785	20	.035	.003246	.003277	.003708	.003502
4	.238	.150107	.151523	.171461	.161945	21	.032	.002714	.002739	.0031	.002928
5	.22	.12826	.12947	.146507	.138376	22	.028	.002078	.002097	.002373	.002241
6	.203	.109204	.110234	.12474	.117817	23	.025	.001656	.001672	.001892	.001787
7	.18	.08586	.086667	.098075	.092632	24	.022	.001283	.001295	.001465	.001384
8	.165	.072146	.072827	.08241	.077836	25	.02	.00106	.001070	.001211	.001144
9	.148	.058046	.058593	.066303	.062624	26	.018	.0008586	.0008667	.0009807	.0009263
10	.134	.047583	.048032	.054353	.051336	27	.016	.0006784	.0006848	.0007749	.0007319
11	.12	.03816	.03852	.043589	.04117	28	.014	.0005194	.0005243	.0005933	.0005604
12	.109	.031485	.031782	.035964	.033968	29	.013	.0004479	.0004521	.0005116	.0004832
13	.095	.023916	.024142	.027319	.025802	30	.012	.0003816	.0003852	.0004359	.0004117

Weight of a Square Foot of Cast and Wrought Iron, Copper, Lead, Brass, and Zinc.

FROM $\frac{1}{16}$ TO 1 INCH IN THICKNESS.

Thickness.	Cast Iron.	Wrought Iron.	Copper.	Lead.	Brass.	Zinc.
Inch.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
$\frac{1}{16}$	2.346	2.517	2.89	3.691	2.675	2.34
$\frac{1}{8}$	4.693	5.035	5.781	7.382	5.35	4.68
$\frac{3}{16}$	7.039	7.552	8.672	11.074	8.025	7.02
$\frac{1}{4}$	9.386	10.07	11.562	14.765	10.7	9.36
$\frac{5}{16}$	11.733	12.588	14.453	18.456	13.375	11.7
$\frac{3}{8}$	14.079	15.106	17.344	22.148	16.05	14.04
$\frac{7}{16}$	16.426	17.623	20.234	25.839	18.725	16.34
$\frac{1}{2}$	18.773	20.141	23.125	29.53	21.4	18.72
$\frac{9}{16}$	21.119	22.659	26.016	33.222	24.075	
$\frac{5}{8}$	23.466	25.176	28.906	36.913	26.75	
$\frac{11}{16}$	25.812	27.694	31.797	40.604	29.425	
$\frac{3}{4}$	28.159	30.211	34.688	44.296	32.1	
$\frac{13}{16}$	30.505	32.729	37.578	47.987		
$\frac{7}{8}$	32.852	35.247	40.469	51.678		
$\frac{15}{16}$	35.199	37.764	43.359	55.37		
1	37.545	40.282	46.25	59.061		

NOTE.—The wrought iron and copper is that of hard rolled plates.

Comparison of Wire Gauges.

No.	*American Gauge.*	*Birmingham Gauge.*	*No.*	*American Gauge.*	*Birmingham Gauge.*
0000	$\frac{7}{16}$ inch, full	$\frac{7}{16}$ inch, full.	7		$\frac{3}{16}$ inch, scant.
00	$\frac{3}{8}$ inch, scant	$\frac{3}{8}$ inch, full.	8	$\frac{1}{8}$ inch, full	
0	$\frac{5}{16}$ inch, full		11		$\frac{1}{8}$ inch, scant.
1		$\frac{5}{16}$ inch, scant.	14	$\frac{1}{16}$ inch, full	
2	$\frac{1}{4}$ inch, full		16		$\frac{1}{16}$ inch, full.
3		$\frac{1}{4}$ inch, full.	20	$\frac{1}{32}$ inch, full	
5	$\frac{3}{16}$ inch, scant		21		$\frac{1}{32}$ inch, full.

Value in Inches of the Birmingham Gauge for Wire, Sheet Iron, Brass, Copper, Steel, Etc.

No. of Gauge.	Value in Decimals.	Value in common fraction.	No. of Gauge.	Value in Decimals.	Value in common fraction.
0	.340	$\frac{21}{64}$	19	.042	$\frac{5}{128}$
1	.300	$\frac{19}{64}$	20	.035	.....
2	.284	$\frac{9}{32}$	21	.032	$\frac{1}{32}$
3	.259	$\frac{1}{4}$	22	.028	.....
4	.238	$\frac{15}{64}$	23	.025	$\frac{3}{128}$
5	.220	$\frac{7}{32}$	24	.022	.....
6	.203	$\frac{13}{64}$	25	.020	$\frac{5}{256}$
7	.180	$\frac{11}{64}$	26	.018	.....
8	.165	$\frac{5}{32}$	27	.016	$\frac{1}{64}$
9	.148	$\frac{9}{64}$	28	.014	.....
10	.134	$\frac{1}{8}$	29	.013	.....
11	.120	$\frac{7}{64}$	30	.012	$\frac{3}{256}$
12	.109	$\frac{13}{128}$	31	.010	.....
13	.095	$\frac{6}{64}$	32	.009	.....
14	.083	$\frac{5}{64}$	33	.008	$\frac{1}{128}$
15	.072	$\frac{9}{128}$	34	.007	.....
16	.065	$\frac{1}{16}$	35	.005	.....
17	.058	$\frac{7}{128}$	36	.004	$\frac{1}{256}$
18	.049	$\frac{3}{64}$			

Table of the Decimal Parts of A Pound (16 oz.).

Decimal.	Oz.	Decimal.	Oz.	Decimal.	Oz.	Decimal.	Oz.	Decimal.	Oz.
.0625	1	.25	4	.4375	7	.625	10	.8125	13
.09375	1½	.28125	4½	.46875	7½	.65625	10½	.84375	13½
.125	2	.3125	5	.5	8	.6875	11	.875	14
.15625	2½	.34375	5½	.53125	8½	.71875	11½	.90625	14½
.1875	3	.375	6	.5625	9	.75	12	.9375	15
.21875	3½	.40625	6½	.59375	9½	.78125	12½	.96875	15½

EXAMPLE.—Suppose I wish to know the weight of a bar of round iron, 2½ inches in diameter, and 13 feet long. Referring to the tables, I find it to be 212.68 pounds, *i.e.*, $212\frac{68}{100}$ pounds; and in order to know the weight of this decimal in ounces, refer to the above table for the decimal highest to it in number, and it will be found to be .6875, of which take only the first two points (the others being of very little value), and against it you have 11 ounces, the weight of the decimal given. Other points will be easily found in a similar manner.

Size, Weight, Length, and Strength of American Iron Wire.

Number by wire gauge.	Diameter in Decimals of 1 inch.	Feet to the lb.	Weight of 100 yards in lbs.	Weight of one mile in lbs.	Length of one Bundle (63 lb.) in yards.	Area of section in decimals of one sq. inch.	Actual breaking weight in lbs.	Tensile strength per sq. inch of section in lbs.
00000	.450	1.863	160.985	2845.34	39.12	.15904	12598	78903
0000	.400	2.358	127.208	2238.86	49 52	.12566	9955	79326
000	.360	2.911	103.043	1813.56	61.13	.10179	8124	79813
00	.330	3.465	86.583	1523.86	72.77	.08553	6880	80437
0	.305	4.057	73.958	1301.66	85.20	.07306	5926	81110
1	.285	4.645	64 583	1136.66	97.55	.06379	5226	81925
2	.265	5.374	55.829	982.59	112.85	.05515	4570	82873
3	.245	6.286	47.722	839.91	132.01	.04714	3948	83756
4	.225	7.454	40.248	708.36	156.53	.03976	3374	84862
5	.205	8.976	33.417	588.14	188.50	.03301	2839	86000
6	.190	10.453	28.699	505.10	219.51	.02835	2476	87349
7	.175	12.322	24.346	428.49	258.76	.02405	2136	88802
8	.160	14.736	20.358	358.30	309.46	.02011	1813	90153
9	.145	17.950	16.713	294.15	376.95	.01651	1507	91276
10	.130	22.333	13.433	236.42	468.99	.01327	1233	92890
11	.1175	27.340	10.973	193.12	574.14	.01084	1010	93194
12	.105	34.219	8.767	154.30	718.60	.00866	810	93530
13	.0925	44.092	6.804	119.75	925.93	.00672	631	93917
14	.080	58.916	5.092	89.62	1237.24	.00503	474	94299
15	.070	76.984	3.897	68.59	1616.66	.00385	372	96703
16	.061	101.488	2.956	52.03	2131.25	.00292	292	99922
17	.0525	137.174	2.187	38.49	2880.65	.00216	222	102740
18	.045	186.335	1.610	28.34	3913.04	.00159	169	106343
19	.038	262.238	1.144	20.13	5506.99	.00113	124	109362
20	.033	344.828	.870	15.31	7241.39	.00086	96	111184

Sizes of American Wire Expressed in Fractions of an inch.

(APPROXIMATE.)

No. 00000 . . . . . $\frac{29}{64}$	No. 3 (full) . . . . . $\frac{1}{4}$	No. 14 (small) . . . . . $\frac{5}{64}$
" 0000 . . . . . $\frac{13}{32}$	" 5 . . . . . $\frac{13}{64}$	" 16 (full) . . . . . $\frac{1}{16}$
" 000 . . . . . $\frac{23}{64}$	" 6 (small) . . . . . $\frac{3}{16}$	" 18 (full) . . . . . $\frac{3}{64}$
" 00 . . . . . $\frac{21}{64}$	" 8 (small) . . . . . $\frac{5}{32}$	" 20½ . . . . . $\frac{1}{32}$
" 1 (small) . . . . . $\frac{9}{32}$	" 10½ . . . . . $\frac{1}{8}$	" 28 . . . . . $\frac{1}{64}$
" 2 . . . . . $\frac{17}{64}$	" 13 . . . . . $\frac{3}{32}$	" 36 . . . . . $\frac{1}{128}$

Table of Weights of Sheet Copper per Square Foot, and Thickness per English Wire Gauge.

SPECIAL SIZES MADE TO ORDER.

Stubs' Wire Gauge.	Weight per Square Foot.	14 x 48	24 x 48	30 x 60	36 x 72	48 x 72	Stubs' Wire Gauge.	Weight per Square Foot.	14 x 48	24 x 48	30 x 60	36 x 72	48 x 72
No.	lbs. oz.	lbs.	lbs.	lbs.	lbs.	lbs.	No.	lbs. oz.	lbs.	lbs.	lbs.	lbs.	lbs.
1	14 8	.....	116	181	261	348	15	3 4	.....	26	41	59	78
2	13 14	.....	111	174	250	334	16	2 14	.....	23	36	62	70
3	12 12	.....	102	159	230	306	17	2 8	.....	20	32	45	60
4	11 9	.....	93	145	209	278	18	2 2	.....	18	27	89	52
5	10 1	.....	81	126	182	242	19	1 15	.....	16	24	35	47
6	9 6	.....	75	118	169	226	20	1 12	.....	14	22	32	43
7	8 11	.....	70	109	157	209	21	1 9	.....	13	20	29	39
8	7 14	.....	63	99	142	190	22	1 7	$6\frac{1}{2}$	12	18	26	35
9	7 3	.....	58	90	130	173	23	1 4	$5\frac{7}{8}$	10	16	23	31
10	6 8	.....	48	81	117	156	24	1 2	$5\frac{1}{4}$	9	15	21	28
11	5 12	.....	46	73	104	139	25	1 0	$4\frac{5}{8}$	8	$12\frac{1}{2}$	19	25
12	5 1	.....	41	64	91	122	26	14	4	7	11	15	21
13	4 5	.....	35	54	78	104	27	12	$3\frac{1}{2}$	6	$9\frac{3}{8}$	13	18
14	3 9	.....	29	45	65	86	28	10	3	5	7	11	15

Weight of Sheet Copper per Square Foot.

$\frac{1}{16}$ inch thick weighs	. . . . .	. . . . .	3 lbs to the square foot.
$\frac{1}{8}$ " "	. . . . .	. . . . .	6 " "
$\frac{1}{4}$ " "	. . . . .	. . . . .	12 " "
$\frac{1}{2}$ " "	. . . . .	. . . . .	24 " "

The area of a circle is equal to the square of the diameter multiplied by 0.7854.

The circumference of a circle is equal to the diameter multiplied by 3.1416.

To Ascertain the Weight of Copper.—Find the number of cubic inches in the piece, multiply by 0.3214, and the product will be the weight in pounds.

Or, multiply the length and breadth (in feet), and that by the pounds per square foot.

Weight of Copper Rods or Bolts, from $\frac{1}{8}$ to 4 inches in Diameter, one foot in length.

Diameter.	Weight.	Diameter.	Weight.	Diameter.	Weight.	Diameter.	Weight.
Inch.	Lbs.	Inch.	Lbs.	Inch.	Lbs.	Inch.	Lbs.
$\frac{1}{8}$	.0473	$\frac{13}{16}$	1.9982	$1\frac{1}{2}$	6.8109	$2\frac{3}{4}$	22.8913
$\frac{3}{16}$	.1064	$\frac{7}{8}$	2.3176	$1\frac{9}{16}$	7.3898	$2\frac{7}{8}$	25.0188
$\frac{1}{4}$	.1892	$\frac{15}{16}$	2.6605	$1\frac{5}{8}$	7.9931	3	27.2435
$\frac{5}{16}$	.2956	1	3.027	$1\frac{3}{4}$	9.2702	$3\frac{1}{8}$	29.5594
$\frac{3}{8}$	.4256	$1\frac{1}{16}$	3.417	$1\frac{7}{8}$	10.642	$3\frac{1}{4}$	31.9722
$\frac{7}{16}$	.5794	$1\frac{1}{8}$	3.8312	2	12.1082	$3\frac{3}{8}$	34.4815
$\frac{1}{2}$	.7567	$1\frac{3}{16}$	4.2688	$2\frac{1}{8}$	13.6677	$3\frac{1}{2}$	37.0808
$\frac{9}{16}$	.9578	$1\frac{1}{4}$	4.7228	$2\frac{1}{4}$	15.3251	$3\frac{5}{8}$	39.7774
$\frac{5}{8}$	1.1824	$1\frac{5}{16}$	5.214	$2\frac{3}{8}$	17.075	$3\frac{3}{4}$	42.568
$\frac{11}{16}$	1.4307	$1\frac{3}{8}$	5.7228	$2\frac{1}{2}$	18.9161	$3\frac{7}{8}$	45.455
$\frac{3}{4}$	1.7027	$1\frac{7}{16}$	6.2547	$2\frac{5}{8}$	20.8562	4	48.433

Square Bolt Copper.

WEIGHT PER LINEAL FOOT.

Size.	Weight.	Size.	Weight.	Size.	Weight.	Size.	Weight.
Inch.	Lbs.	Inch.	Lbs.	Inch.	Lbs.	Inch.	Lbs.
$\frac{1}{4}$	.24	$\frac{3}{4}$	2.16	$1\frac{1}{4}$	6.	$1\frac{3}{4}$	11.77
$\frac{3}{8}$	.54	$\frac{7}{8}$	2.94	$1\frac{3}{8}$	7.27	$1\frac{7}{8}$	13.52
$\frac{1}{2}$	.96	1	3.84	$1\frac{1}{2}$	8.65	2	15.38
$\frac{5}{8}$	1.50	$1\frac{1}{8}$	4.86	$1\frac{5}{8}$	10.15		

Tables Showing Number of Copper Rivets and Burrs to the Pound.

BELT RIVETS AND BURRS.

No.	$\frac{1}{4}$	$\frac{3}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	Burrs.
7	272	240	228	180	164	160	148	112	105	100	84	80	69	345
8	276	248	208	200	178	172	152	136	110	104	96	.....	.....	390
9	340	280	272	248	228	220	184	176	156	136	.....	.....	.....	610
10	544	448	384	340	304	300	272	238	204	.....	.....	.....	.....	716
12	588	512	452	404	364	334	304	272	.....	.....	.....	.....	.....	985
13	996	852	532	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1630

COPPER HOSE RIVETS AND BURRS.

No.	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	Burrs.
7	.....	.....	155	142	133	122	109	97	345
8	308	201	181	160	150	135	116	100	390

OVAL HEAD OR TRUNK COPPER RIVETS AND BURRS.

No.	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	Burrs.
9	320	285	259	243	219	199	177	159	137	123	113	104	610

Copper Braziers' Rivets.

No.	0	1	2	3	4	5	6	7	8	9	10
	148	100	70	44	34	24	18	12	9	6	4

Table Showing the Difference between Wire Gauges.

No.	London.	Stubs'.	Brown & Sharpe's.	No.	London.	Stubs'.	Brown & Sharpe's.
0000	.454	.454	.460	19	.040	.042	.03589
000	.425	.425	.40964	20	.035	.035	.03196
00	.380	.380	.36480	21	.0315	.032	.02846
0	.340	.340	.32495	22	.0295	.028	.025347
1	.300	.300	.28930	23	.027	.025	.022571
2	.284	.284	.25763	24	.025	.022	.0201
3	.259	.259	.22942	25	.023	.020	.0179
4	.238	.238	.20431	26	.0205	.018	.01594
5	.220	.220	.18194	27	.01875	.016	.014195
6	.203	.203	.16202	28	.01725	.014	.012641
7	.180	.180	.14428	29	.0155	.013	.011257
8	.165	.165	.12849	30	.01375	.012	.010025
9	.148	.148	.11443	31	.01225	.010	.008928
10	.134	.134	.10189	32	.01125	.009	.00795
11	.120	.120	.09074	33	.01025	.008	.00708
12	.109	.109	.08081	34	.0095	.007	.0063
13	.095	.095	.07196	35	.0085	.005	.00561
14	.083	.083	.06408	36	.0075	.004	.005
15	.072	.072	.05706	37	.0065		.00445
16	.065	.065	.05082	38	.00575		.003965
17	.058	.058	.04525	39	.005		.003531
18	.049	.049	.04030	40	.0045		.003144

Weight per Square Foot of American Black Sheet Iron.

No.	Weight per sq. foot.	Square feet per ton.	No.	Weight per sq. foot.	Square feet per ton.	No.	Weight per sq. foot.	Square feet per ton.	No.	Weight per sq. foot.	Square feet per ton.
	oz.	about.		oz.	about.		oz.	about		oz.	about
30	11	3259	26	15	2389	22	21	1706	18	38	943
29	12	2987	25	16	2240	21	24	1493	17	43	833
28	13	2757	24	17	2108	20	28	1280	16	48	746
27	14	2685	23	19	1886	19	33	1086	14	60	597

Weight per Square Foot Galvanized Sheet Iron.

No. Wire Gauge.	Weight per square foot.	Square feet per ton.	No. Wire Gauge.	Weight per square foot.	Square feet per ton.	No. Wire Gauge.	Weight per square foot.	Square feet per ton.
	oz.	about.		oz.	about.		oz.	about.
29	12	2987	24	17	2108	19	33	1086
28	13	2757	23	19	1886	18	38	943
27	14	2560	22	21	1706	17	43	833
26	15	2389	21	24	1493	16	48	746
25	16	2240	20	28	1280	14	60	597

Corrugated Iron—Black or Galvanized.

LARGE CORRUGATIONS.

From centre to centre	5 inches.
Depth	$1\frac{1}{4}$ "
Extreme length of sheets	96 "

SMALL CORRUGATIONS.

From centre to centre	$2\frac{1}{2}$ inches.
Depth	$\frac{5}{8}$ or $\frac{3}{4}$ "
Length of sheets (usual)	96 "
Length of sheets (extreme)	120 "
Covering surface of sheet in the roof (usual width)	25 "
Covering surface of sheet in the roof (extreme width)	30 "

Approximate Weight of Corrugated Iron per Square Foot of Covering Surface.

	5 x 1¼	2½ x ⅝	2½ x ¾		5 x ¼	2½ x ⅝	2½ x ¾
No. 20	33 oz.	33 oz.	35 oz.	No. 24	20 oz.	20 oz.	21 oz.
No. 22	24 oz.	24 oz.	26 oz.	No. 26	18 oz.	18 oz.	19 oz.

In putting on corrugated sheets, 4 inches are generally allowed for lap at the ends, and 6 inches allowed for extension over the eaves.

The frame work of the roof, whether wooden rafters or iron beams are used, need not be over one-fourth as strong as would be necessary for slate.

To estimate weight per square foot of covering surface.—For 5 x 1¼ and 2½ x ⅝ corrugations, add one-fifth to weight of plain sheet per square foot.

For 2½ x ¾ corrugations, add one-fourth to weight of plain sheet per square foot.

Number of Nuts in One Pound.

APPROXIMATE.

Cold Pressed.			Cold Pressed.			Forged.			Forged.		
Size.	Blank.	Tapped.	Size.	Blank.	Tapped.	Size.	Blank.	Tapped.	Size.	Blank.	Tapped.
No. 8	260	271	No. 18	54	55	No. 9	315	325	No. 15	83	85
" 10	180	187	" 19	44	47	" 10	222	235	" 17	85	86
" 12	145	152	" 22	34	35	" 11	182	190	" 19	47	49
" 14	126	130	" 24	35	36	" 12	170	177	" 21½	44	45
" 15	91	94	" 26	24	25	" 12½	125	130	" 22	34	35
" 16	79	81									

Thousand Rivets.

APPROXIMATE DIMENSIONS.

Size.	Length.	Diam. Wire Gauge.	Size.	Length.	Diam. Wire Gauge.
8 ounce.	5/32	No. 13¼	3½ pounds.	21/64	No. 8
10 "	11/64	" 13	4 "	11/32	" 7¼
12 "	3/16	" 12¼	5 "	3/8	" 6¾
14 "	3/16	" 12	6 "	25/64	" 6
1 pound.	13/64	" 11¾	7 "	13/32	" 5¼
1¼ "	7/32	" 11	8 "	7/16	" 4¾
1½ "	15/64	" 10¼	9 "	29/64	" 4¼
1¾ "	1/4	" 10	10 "	15/32	" 4
2 "	17/64	" 9¼	12 "	1/2	" 3
2½ "	9/32	" 9	14 "	33/64	" 2
3 "	5/16	" 8¼	16 "	17/32	" 1

Cooper Rivets.

APPROXIMATE DIMENSIONS.

Size.	Length.	Diam. Wire Gauge.	Size.	Length.	Diam. Wire Gauge.
1d	13/32	No. 4	4d	17/32	No. 1
2d	7/16	" 3	5d	19/32	" 0
3d	15/32	" 2	6d	11/16	" 00

ROUND HEAD RIVETS.

Number of rivets in one pound.

APPROXIMATE.

Size.	$\frac{3}{8}$	0	$\frac{5}{16}$	1	2	3	$\frac{1}{4}$	4	5	6	$\frac{3}{16}$	7	8	9
$\frac{3}{8}$										154	188	221	256	334
$\frac{1}{2}$	32	42	51	57	65	75	80	89	108	131	159	185	215	278
$\frac{5}{8}$	29	37	45	50	57	67	70	78	94	114	138	158	185	238
$\frac{3}{4}$	26	33	41	45	51	59	63	70	84	101	122	139	163	208
$\frac{7}{8}$	24	30	37	41	46	54	57	63	75	91	109	123	145	185
1	22	28	34	37	42	49	52	57	68	82	98	111	131	166
$1\frac{1}{8}$	20	26	31	34	39	45	47	53	63	75	90	101	119	151
$1\frac{1}{4}$	19	24	29	32	36	42	44	49	58	69	83	93	109	138
$1\frac{3}{8}$	18	22	27	29	33	39	41	45	54	54	76	86	101	127
$1\frac{1}{2}$	17	21	25	28	31	37	38	42	51	59	71	80	94	119
$1\frac{3}{4}$	15	18	22	24	27	33	34	40	44	55	63	70	82	104
2	13	17	20	22	25	29	30	35	40	47	56	62	73	92
$2\frac{1}{4}$	12	15	18	19	22	27	28	32	36	42	50	56	66	83
$2\frac{1}{2}$	11	14	17	18	20	24	25	29	33	39	46	50	60	75
$2\frac{3}{4}$	10	13	15	17	19	22	23	26	30	36	42	46	55	67
3	9	12	14	15	17	21	22	24	28	33	39	43	51	64
$3\frac{1}{4}$	8	11	13	14	16	19	20	23	26	31	36	40	47	59
$3\frac{1}{2}$	$8\frac{1}{2}$	$10\frac{1}{2}$	12	$13\frac{1}{2}$	15	18	19	21	24	29	34	38	44	55
$3\frac{3}{4}$	$7\frac{1}{2}$	$9\frac{3}{4}$	$11\frac{3}{4}$	$12\frac{3}{4}$	14	17	18	20	23	27	32	35	41	52
4	$7\frac{1}{4}$	$9\frac{1}{4}$	11	12	13	16	17	18	21	25	30	33	38	49
$4\frac{1}{4}$	7	$8\frac{3}{4}$	$10\frac{1}{2}$	$11\frac{1}{4}$	$12\frac{3}{4}$	15	16	17	20	24				
$4\frac{1}{2}$	$6\frac{1}{2}$	$8\frac{1}{4}$	10	$10\frac{3}{4}$	12	14	15	16	19	23				
$4\frac{3}{4}$	$6\frac{1}{4}$	8	$9\frac{1}{4}$	10	$11\frac{1}{2}$	$13\frac{3}{4}$	$14\frac{3}{4}$	$15\frac{3}{4}$	18	22				
5	6	$7\frac{1}{2}$	9	$9\frac{3}{4}$	11	13	14	15	17	21				
$5\frac{1}{4}$	$5\frac{3}{4}$	$7\frac{1}{4}$	$8\frac{1}{2}$	$9\frac{1}{4}$	$10\frac{1}{2}$	$12\frac{1}{2}$	$13\frac{1}{2}$	$14\frac{1}{2}$	$16\frac{1}{2}$	20				
$5\frac{1}{2}$	$5\frac{1}{2}$	7	$8\frac{1}{4}$	9	10	12	13	14	16	19				
$5\frac{3}{4}$	$5\frac{1}{4}$	$6\frac{3}{4}$	$7\frac{3}{4}$	$8\frac{1}{2}$	$9\frac{1}{2}$	$11\frac{1}{2}$	$12\frac{1}{2}$	$13\frac{1}{2}$	15	18				
6	5	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{4}$	$9\frac{1}{4}$	11	12	13	14	17				

WEIGHT AND NUMBER OF RUSSIA SHEET IRON.

	Size.	Weight per sheet	Wire Gauge.		Size.	Weight per Sheet.	Wire Gauge.
No. 7	28x56 inches.	$6\frac{3}{10}$ pounds.	No. 29	No. 12	28x56 inches.	$10\frac{8}{10}$ pounds.	No. $24\frac{1}{2}$
" 8	" "	$7\frac{2}{10}$ "	" 28	" 13	" "	$11\frac{7}{10}$ "	" 24
" 9	" "	$8\frac{1}{10}$ "	" 27	" 14	" "	$12\frac{6}{10}$ "	" 23
" 10	" "	9 "	" 26	" 15	" "	$13\frac{1}{2}$ "	" 22
" 11	" "	$9\frac{9}{10}$ "	" 25	" 16	" "	$14\frac{4}{10}$ "	" 21

Average weight per bundle, about 240 pounds

STANDARD WEIGHTS SHEET ZINC.

Number.		Weight.		Number.		Weight.	
Zinc Gauge.	Wire Gauge.	Square foot in lbs.	Sheet 36x84 in lbs.	Zinc Gauge.	Wire Gauge,	Square foot in lbs.	Sheet 36x84 in lbs.
6	30	0.47	10.05	13	23	1.22	25.68
7	29	0.54	11.47	14	22	1.36	28.52
8	28	0.61	12.90	15	21	1.49	31.36
9	27	0.68	14.32	16	20	1.63	34.20
10	26	0.82	17.16	18	18	2.17	45.55
11	25	0.95	20.00	19	17	2.44	51.23
12	24	1.09	22.84				

To polish zinc, take one part muriatic acid to two parts of water, scour the zinc well with this mixture and fine sand; then dry carefully, and give a thin coating of oil.

Approximate Number of Wire Nails to the Pound.

Length.	3-16	¼	⅜	½	⅝	¾	⅞	1	1⅛	1¼	1½	1¾	2	2¼	2½	2¾	3	3½	4	4½	5	6	7	8	9	10	11	12
Wire Gauge.																												
00 and ⅛	.....	.....	.....	.....	.....	.....	.....	.....	.....	33	27	23	20	18	16	15	14	12	10	9	8	7	6	5	4½	4	3¾	3¼
0	.....	.....	.....	.....	.....	.....	.....	.....	.....	34	29	25	21	19	17	16	15	13	11	10	9	8	7	5½	5	4½	4	3½
1 and 5-16	.....	.....	.....	.....	.....	.....	.....	57	50	45	38	32	28	25	23	21	19	16	14	13	11	10	8	7	6	5½	5	4½
2	.....	.....	.....	.....	.....	.....	.....	65	58	52	44	37	32	29	26	24	22	19	16	14	13	11	9	8	7	6½	6	5½
3	.....	.....	.....	.....	.....	100	87	76	67	60	50	43	38	34	30	28	25	22	19	17	15	13	11	10	8	7½	.....	.....
4	.....	.....	.....	.....	.....	120	103	90	80	72	60	51	45	40	36	33	30	26	23	20	18	15	13	11	10	9	.....	.....
5	.....	.....	.....	211	169	141	121	106	94	85	71	60	53	47	42	39	35	30	26	24	21	18	15	.....	.....	.....	.....	.....
6	.....	.....	.....	247	197	164	141	123	111	99	82	71	62	55	50	45	41	35	31	28	25	21	18	.....	.....	.....	.....	.....
7	.....	.....	.....	299	239	200	171	149	133	120	100	85	75	67	60	54	50	43	37	33	30	25	..	.....	.....	.....	.....	.....
8	.....	.....	.....	345	275	229	197	172	153	137	115	98	86	76	69	62	57	49	43	39	35	29	...	.....	.....	.....	.....	.....
9	.....	.....	.....	414	331	276	236	207	184	165	138	118	103	92	82	75	69	59	52	46	41	...	...	.....	.....	.....	.....	.....
10	.....	.....	653	496	397	333	283	248	220	198	165	142	124	110	99	90	83	71	62	55	50	...	...	.....	.....	.....	.....	.....
11	.....	.....	837	628	502	418	359	314	279	251	209	179	157	139	125	114	105	90	79	70	...	...	...	.....	.....	.....	.....	.....
12	.....	.....	1096	822	658	548	469	411	365	329	274	235	205	182	164	149	137	117	103	.....	...	...	...	.....	.....	.....	.....	.....
13	.....	.....	1429	1072	857	714	613	536	476	429	357	306	268	238	214	195	178	153	.....	.....	.....	...	...	.....	.....	.....	.....	.....
14	.....	2840	1893	1420	1136	947	811	710	631	568	473	406	350	315	284	258	236	.....	.....	.....	.....	...	...	.....	.....	.....	.....	.....
15	.....	3504	2336	1752	1402	1168	1001	876	778	701	584	500	438	389	350	.....	.....	.....	.....	.....	.....	...	...	.....	.....	.....	.....	.....
16	.....	4571	3048	2280	1828	1523	1305	1143	1015	913	761	653	571	508	.....	.....	.....	.....	.....	.....	.....	...	...	.....	.....	.....	.....	.....
17	.....	6233	4156	3116	2495	2077	1781	1558	1385	1246	1038	890	779	.....	.....	.....	.....	.....	.....	.....	.....	...	...	.....	.....	.....	.....	.....
18	.....	8276	5517	4138	3310	2758	2364	2069	1839	1655	1379	1182	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	...	.....	.....	.....	.....	.....
19	.....	10668	7112	5334	4267	3556	2933	2667	2370	2133	1778	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	...	.....	.....	.....	.....	.....
20	20000	15000	10000	7500	6000	5000	4400	3750	3333	3000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	...	.....	.....	.....	.....	.....
21	23702	17777	11850	8888	7111	5926	5079	4444	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	...	.....	.....	.....	.....	.....
22	30476	22856	15237	11428	9143	7618	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	...	.....	.....	.....	.....	.....

These approximate numbers are an average only, and the figures given may be varied either way by changes in the dimensions of the heads or points.

Stock Sizes Tin Plate.

Size.	Thickness.	No. shts. per box.	Size.	Thickness.	No. shts. per box.	Size.	Thickness.	No. shts. per box.	Size.	Thickness.	No. shts. per box.
10 x 14	IC	225	10½ x 19½	IC	112	14 x 22	IXX	112	16 x 19	IC	112
"	IX	225	"	IX	112	14 x 24	IC	112	"	IX	112
"	IXX	225	"	IXX	112	"	IX	112	"	IXX	112
"	IXXX	225	11 x 11	IC	225	"	IXX	112	16 x 20	IC	112
"	IXXXX	225	"	IX	225	14 x 25	IC	112	"	IX	112
14 x 20	IC	112	"	IXX	225	"	IX	112	17 x 17	IC	112
"	IX	112	11 x 22	IC	225	"	IXX	112	"	IX	112
"	IXX	112	"	IX	112	14 x 26	IX	112	"	IXX	112
"	IXXX	112	11 x 21	IC	112	"	IXX	112	17 x 25	DC	100
"	IXXXX	112	"	IXX	112	14 x 28	IC	112	"	DX	100
12 x 12	IC	225	12 x 20	IC	112	"	IX	112	"	DXX	100
"	IX	225	"	IX	112	"	IXX	112	18 x 18	IC	112
"	IXX	225	12 x 24	IC	112	14 x 30	IX	112	"	IX	112
"	IXXXX	225	"	IX	112	"	IXX	112	"	IXX	112
12½ x 17	DC	100	"	IXX	112	14 x 31	IX	112	"	IXXXX	112
"	DX	100	"	IXXX	112	"	IXX	112	19 x 19	IC	112
"	DXX	100	12¼ x 22½	IC	112	14 x 36	IX	112	"	IX	112
"	DXXX	100	"	IX	112	14 x 56	IX	56	"	IXX	112
"	DXXXX	100	"	IXX	112	"	IXX	56	20 x 20	IC	112
20 x 28	IC	112	13 x 13	IC	225	14 x 60	IX	56	"	IX	112
"	IX	112	"	IX	225	"	IXX	56	"	IXX	112
"	IXX	112	"	IXX	225	15 x 15	IC	225	"	IXXX	112
"	IXXX	56	13 x 26	IC	112	"	IX	225	"	IXXXX	112
"	IXXXX	56	"	IX	112	"	IXX	225	22 x 22	IC	112
9 x 18	IC	225	"	IXX	112	"	IXXXX	225	"	IX	112
"	IX	225	13½ x 24½	IX	112	15 x 21	DX	100	"	IXX	112
10 x 10	IC	225	"	IXX	112	"	DXX	100	"	IXXX	112
"	IX	225	14 x 14	IC	225	"	DXXX	100	"	IXXXX	112
"	IXX	225	"	IX	225	"	DXXXX	100	24 x 24	IX	112
10 x 20	IC	225	"	IXX	225	16 x 16	IC	225	"	IXX	112
"	IX	225	14 x 22	IC	112	"	IX	225	"	IXXX	112
"	IXX	225	"	IX	112	"	IXX	225	"	IXXXX	112

Stock Sizes Terne Plates, Tinned Sheets and Taggers' Tin and Iron.

TINNED SHEETS.

Size.	Wire Gauge.	Size.	Wire Gauge.
30 x 72	IXX	36 x 84	No. 18
"	IXXX	"	" 19
"	IXXXX	"	" 20
"	IXXXXX	"	" 22
"	No. 21	"	" 24
"	" 22	36 x 96	" 19
36 x 72	IXXX	"	IXXXX
"	IXXXX	40 x 96	" 19
36 x 84	IXXXX	"	IXXXX

Special sizes furnished to order.

TAGGERS' TIN.

Size.	Wire Gauge.	Sheets per Box.	Size.	Wire Gauge.	Sheets per Box.
10 x 14	No. 34	300	14 x 20	No. 34	150
"	" 36	360	"	" 36	180
"	" 38	450	"	" 38	225

TAGGERS' IRON.

Size.	Wire Gauge.	Sheets per Box.	Size.	Wire Gauge.	Sheets per Box.
10 x 14	No. 32	256	10 x 14	No. 36	360
"	" 34	300	"	" 38	450

TERNE PLATES.

Size.	Thickness.	No. Sheets Per Box.	Size.	Thickness.	No. Sheets Per Box.
14 x 20	IC	112	14 in. x 200 feet	IC	
"	IX	112	" "	IX	
20 x 28	IC	112	20 in. x 200 feet	IC	
"	IX	112	" "	IX	
10 x 20	IC	112	28 in. x 200 feet	IC	
"	IX	112	" "	IX	

SCHEDULE OF EXTRAS ON CUT NAILS.

10d to 60d Common	at standard or lowest price.
8d and 9d Common	$0.25 per keg above 10d.
6d and 7d Common	.50 per keg above 10d.
4d and 5d Common	.75 per keg above 10d.
3d Common	1.50 per keg above 10d.
2d and 3d Fine	2.25 per keg above 10d.
Cut Spikes, all sizes	.25 per keg above 10d.

Fencing and sheathing, same price as same size common nails

	3d	4d and 5d	6d	8d	10d and larger.
Coopers', Slating, and Tobacco	$2.00	$1.25	$1.00	$0.75	$0.50 per keg above 10d common.
Casing, Flooring, and Box		1.50	1.25	1.00	.75 per keg above 10d common.
Finishing		1.75	1.50	1.25	1.00 per keg above 10d common.
Trunk		1.75			

	2 and $2\frac{1}{4}$ in.	$2\frac{1}{2}$ and $2\frac{3}{4}$ in.	3 in. and longer.
Clinch	$2.00	$1.75	$1.50 per keg above 10d common.
Clinch, in half kegs	2.50	2.25	2.00 per 100 lbs. above 10d common.

Number of Nails and Tacks to the Pound.

Nails.			Tacks.		
Title.	Length.	No. in a lb.	Title.	Length.	No. per lb.
3 penny fine.	$1\frac{1}{8}$ inch	760 nails.	1 ounce	$\frac{3}{16}$ inch	16,000
3 " common	$1\frac{1}{4}$ "	480 "	$1\frac{1}{2}$ "	$\frac{7}{32}$ "	10,666
4 " "	$1\frac{1}{2}$ "	300 "	2 "	$\frac{1}{4}$ "	8,000
5 " "	$1\frac{3}{4}$ "	200 "	$2\frac{1}{2}$ "	$\frac{5}{16}$ "	6,400
6 " "	2 "	160 "	3 "	$\frac{3}{8}$ "	5,332
7 " "	$2\frac{1}{4}$ "	128 "	4 "	$\frac{7}{16}$ "	4,000
8 " "	$2\frac{1}{2}$ "	93 "	6 "	$\frac{8}{16}$ "	2,666
9 " "	$2\frac{3}{4}$ "	72 "	8 "	$\frac{9}{16}$ "	2,000
10 " "	3 "	60 "	10 "	$\frac{10}{16}$ "	1,600
12 " "	$3\frac{1}{4}$ "	44 "	12 "	$\frac{11}{16}$ "	1,332
16 " "	$3\frac{1}{2}$ "	32 "	14 "	$\frac{12}{16}$ "	1,142
20 " "	4 "	24 "	16 "	$\frac{13}{16}$ "	1,000
30 " "	$4\frac{1}{2}$ "	18 "	18 "	$\frac{14}{16}$ "	888
40 " "	5 "	14 "	20 "	$\frac{15}{16}$ "	800
50 " "	$5\frac{1}{2}$ "	12 "	22 "	1 "	727
60 " "	6 "	10 "	24 "	$1\frac{1}{2}$ "	666
6 " fence	2 "	80 "			
8 " "	$2\frac{1}{2}$ "	50 "			
10 " "	3 "	34 "			
12 " "	$3\frac{1}{4}$ "	29 "			

Number of Cut Spikes in Keg of 100 Pounds.

3 inch	2,900	$5\frac{1}{2}$ inch	850
$3\frac{1}{2}$ inch	2,100	6 inch	775
4 inch	1,500	$6\frac{1}{2}$ inch	575
$4\frac{1}{2}$ inch	1,150	7 inch	450
5 inch	950	8 inch	375

Weight and Thickness of Boiler Iron.

$\frac{1}{8}$ inch weighs 5 lbs. per square foot.
$\frac{3}{16}$ inch weighs $7\frac{1}{2}$ lbs. per square foot.
$\frac{1}{4}$ inch weighs 10 lbs. per square foot.
$\frac{5}{16}$ inch weighs $12\frac{1}{2}$ lbs. per square foot.
$\frac{3}{8}$ inch weighs 15 lbs. per square foot.
$\frac{7}{16}$ inch weighs $17\frac{1}{2}$ lbs. per square foot.
$\frac{1}{2}$ inch weighs 20 lbs. per square foot.

No. 1 iron is $\frac{5}{16}$ inch thick.
No. 3 iron is $\frac{9}{32}$ inch thick.
No. 4 iron is $\frac{1}{4}$ inch thick.
No. 5 iron is $\frac{7}{32}$ inch thick.
No. 7 iron is $\frac{3}{16}$ inch thick.

Thickness of Boiler Iron Required

AND PRESSURES ALLOWED BY THE LAWS OF THE UNITED STATES.

Pressure equivalent to the standard for a boiler 42 inches in diameter and $\frac{1}{4}$ inch in thickness.

Thickness in 16ths.	Diameter in Inches.						
	34	36	38	40	42	44	46
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
5	169.9	160.4	152.	144.4	137.5	131.2	125.5
$4\frac{1}{2}$	158.5	149.7	141.8	134.7	128.3	122.5	117.2
$4\frac{1}{4}$	147.2	139.1	131.8	125.1	119.2	113.7	108.8
4	135.9	128.3	121.6	115.5	110.	105.	100.
$3\frac{2}{3}$	124.5	117.6	111.3	105.9	100.8	96.2	92.
$3\frac{1}{3}$	113.2	106.9	101.3	96.2	91.7	87.5	83.
3	101·9	96.2	91.2	82.6	82.5	78.7	75.

Scale of Weights of Lead Pipe, Etc.

Calibre and Mark.	Wt. per ft.		Calibre and Mark.	Wt. per ft.		Calibre and Mark.	Wt. per ft.	
	Lbs.	Oz.		Lbs.	Oz.		Lbs.	Oz.
⅛ inch, AAA	1	12	⅝ inch AA	2	12	1 inch E	1	8
⅛ " AA	1	5	⅝ " A	2	8	1¼ " AAA	7	12
⅛ " A	1	2	⅝ " B	2	0	1¼ " AA	5	12
⅛ " B	1	0	⅝ " C	1	8	1¼ " A	4	12
⅛ " C		13	⅝ " D	1	4	1¼ " B	3	12
⅛ " D		8	⅝ " D	1	0	1¼ " C	3	0
¼ " AAA	3	0	¾ " AAA	4	8	1¼ " D	2	8
¼ " Special	2	8	¾ " AA	3	8	1¼ " E	2	0
¼ " "	2	4	¾ " A	3	0	1½ " AAA	9	8
¼ " AA	2	0	¾ " B	2	4	1½ " AA	7	8
¼ " A	1	11	¾ " C	2	0	1½ " A	6	4
¼ " B	1	4	¾ " D	1	8	1½ " B	5	0
¼ " C	1	0	¾ " E	1	4	1½ " C	4	4
¼ " D		13	1 " AAA	6	0	1½ " D	3	8
⅜ " D		11	1 " AA	4	8	2 " AAA	10	12
⅜ " D		9	1 " A	4	0	2 " AA	9	0
⅜ " AAA	3	8	1 " B	3	4	2 " A	7	0
⅜ " Special	3	0	1 " C	2	8	2 " B	6	0
⅜ " "	2	4	1 " D	2	0	2 " C	5	0

Lead Tubing.

¼ inch . . . . . 5 oz.

Waste Pipe.

In 10 feet lengths.

	Lbs.	Oz.		Lbs.	Oz.
1½ inch	2	4	4 inch	5	8
2 inch	4	0	4 inch	8	0
3 inch	4	8			

Block Tin Pipe.

¼ inch	5 oz.	½ inch	6 and 8 oz.
⅜ inch	4¾, 5⅓, and 8 oz.		

Sheet Lead.

Weight of square foot . . . . . 2, 2½, 3, 3½, 4, 4½, 5, 6, 8 lb., and upwards.

Cost of Tin Roofing.

The following table shows the cost per square and per square foot of tin roofing, laid with 14x20 tin, with tin at any price from $4 to $10 per box. The first column contains the price per box of tin; the second column shows the cost of tin per square (100 square feet) of surface, and the third column shows the cost of tin per square foot of surface.

Flat Seam Roofing, $\frac{3}{8}$ in. Seams.—Cost with 14x20 Tin.

Price of tin per box.	Cost per square of flat roof, 14x20 tin.	Cost per sq. foot.	Price of tin per box.	Cost per square of flat roof, 14x20 tin.	Cost per sq. foot.
$4.25	$2.21	.0221	$8.25	$4.29	.0429
4.50	2.34	.0234	8.50	4.42	.0442
4.75	2.47	.0247	8.75	4.55	.0455
5 00	2.60	.0260	9.00	4.68	.0468
5.25	2.73	.0273	9.25	4.81	.0481
5.50	2.86	.0286	9.50	4.94	.0494
5.75	2.99	.0299	9.75	5.07	.0507
6.00	3.12	.0312	10.00	5.20	.0520
6.25	3.25	.0325	10.25	5.33	.0533
6.50	3.38	.0338	10.50	5.46	.0546
6.75	3.51	.0351	10.75	5.59	.0559
7.00	3.64	.0364	11.00	5.72	.0572
7.25	3.77	.0377	11.25	5.85	.0585
7.50	3.90	.0390	11.50	5.98	.0598
7.75	4.03	.0403	11.75	6.11	.0611
8.00	4.16	.0416	12.00	6.24	.0624

Standing Seam Roofing, 1 in. x $1\frac{1}{4}$ in. x $\frac{3}{8}$ Cross Seams.—Cost with 14x20 Tin.

Price of tin per box.	Cost per square of standing seam roof, with 14x20 tin.	Cost per sq. foot.	Price of tin per box.	Cost per square of standing seam roof, with 14x20 tin.	Cost per sq. foot.
$4.25	$2.37	.0237	$7.25	$4.03	.0403
4.50	2.51	.0251	7.50	4.17	.0417
4.75	2.65	.0265	7.75	4.31	.0431
5.00	2.79	.0279	8.00	4.45	.0445
5.25	2.93	.0293	8.25	4.59	.0459
5.50	3.06	.0306	8.50	4.73	.0473
5.75	3.20	.0320	8.75	4.87	.0487
6.00	3.34	.0334	9.00	5.01	.0501
6.25	3.48	.0348	9.25	5.15	.0515
6.50	3.62	.0362	9.50	5.29	.0529
6.75	3.76	.0376	9.75	5.43	.0543
7.00	3.90	.0390	10.00	5.57	.0557

The following table shows the cost per square and per square foot of tin roofing, laid with 20x28 tin with tin at any price from $8 to $24 per box. The first column contains the price per box of tin; the second column shows the cost of tin per square (100 square feet) of surface, and the third column shows the cost of tin per square foot of surface.

Flat Seam Roofing, $\frac{3}{8}$ in. Seams.—Cost with 20x28 Tin.

Price of tin per box.	Cost per square of flat seam roof, 20x28 tin.	Cost per sq. foot.	Price of tin per box.	Cost per square of flat seam roof, 20x28 tin.	Cost per sq. foot.
$8.00	$2.01	.0201	$16.00	$4.01	.0401
8.50	2.13	.0213	16.50	4.13	.0413
9.00	2.26	.0226	17.00	4.26	.0426
9.50	2.38	.0238	17.50	4.38	.0438
10.00	2.51	.0251	18.00	4.51	.0451
10.50	2.63	.0263	18.50	4.63	.0463
11.00	2.76	.0276	19.00	4.76	.0476
11.50	2.88	.0288	19.50	4.88	.0488
12.00	3.00	.0300	20.00	5.01	.0501
12.50	3.13	.0313	20.50	5.13	.0513
13.00	3.25	.0325	21.00	5.26	.0526
13.50	3.38	.0338	21.50	5.38	.0538
14.00	3.50	.0350	22.00	5.51	.0551
14.50	3.63	.0363	22.50	5.63	.0563
15.00	3.75	.0375	23.00	5.76	.0576
15.50	3.88	.0388			

Cost of Tin Roofing.—Continued.

Standing Seam Roofing, 1 in. x 1¼ in. x ⅜ Cross Seams.—Cost with 20x28 Tin.

Price of tin per box.	Cost per square of standing seam roof, with 20x28 tin.	Cost per sq. foot.	Price of tin per box.	Cost per square of standing seam roof, with 20x28 tin.	Cost per sq. foot.
$8.00	$2.15	.0215	$16.50	$4.42	.0442
8.50	2.28	.0228	17.00	4.56	.0456
9.00	2.41	.0241	17.50	4.69	.0469
9.50	2.55	.0255	18.00	4.82	.0482
10.00	2.68	.0268	18.50	4.96	.0496
10.50	2.82	.0282	19.00	5.09	.0509
11.00	2.95	.0295	19.50	5.23	.0523
11.50	3.09	.0309	20.00	5.36	.0536
12.00	3.21	.0321	20.50	5.49	.0549
12.50	3.35	.0335	21.00	5.63	.0563
13.00	3.48	.0348	21.50	5.76	.0576
13.50	3.62	.0362	22.00	5.90	.0590
14.00	3.75	.0375	22.50	6.03	.0603
14.50	3.89	.0389	23.00	6.17	.0617
15.00	4.02	.0402	23.50	6.30	.0630
15.50	4.15	.0415	24.00	6.43	.0643
16.00	4.29	.0429			

Interest Table.

Six Per Cent.

Time.	$1	$2	$3	$4	$5	$6	$7	$8	$9	$10	$100	$1000
1 day	0	0	0	0	0	0	0	0	0	0	2	17
2 "	0	0	0	0	0	0	0	0	0	0	3	33
3 "	0	0	0	0	0	0	0	0	0	1	5	50
4 "	0	0	0	0	0	0	0	1	1	1	7	67
5 "	0	0	0	0	0	1	1	1	1	1	8	83
6 "	0	0	0	0	1	1	1	1	1	1	10	1 00
7 "	0	0	0	0	1	1	1	1	1	1	12	1 17
8 "	0	0	0	1	1	1	1	1	1	1	13	1 33
9 "	0	0	0	1	1	1	1	1	1	2	15	1 50
10 "	0	0	1	1	1	1	1	1	2	2	17	1 67
11 "	0	0	1	1	1	1	1	1	2	2	18	1 83
12 "	0	0	1	1	1	1	1	2	2	2	20	2 00
13 "	0	0	1	1	1	1	2	2	2	2	22	2 17
14 "	0	0	1	1	1	1	2	2	2	2	23	2 33
15 "	0	1	1	1	1	2	2	2	2	3	25	2 50
16 "	0	1	1	1	1	2	2	2	2	3	27	2 67
17 "	0	1	1	1	1	2	2	2	3	3	28	2 83
18 "	0	1	1	1	2	2	2	2	3	3	30	3 00
19 "	0	1	1	1	2	2	2	3	3	3	32	3 17
20 "	0	1	1	1	2	2	2	3	3	3	33	3 33
21 "	0	1	1	1	2	2	2	3	3	4	35	3 50
22 "	0	1	1	1	2	2	3	3	3	4	37	3 67
23 "	0	1	1	2	2	2	3	3	3	4	38	3 83
24 "	0	1	1	2	2	2	3	3	4	4	40	4 00
25 "	0	1	1	2	2	3	3	3	4	4	42	4 17
26 "	0	1	1	2	2	3	3	3	4	4	43	4 33
27 "	0	1	1	2	2	3	3	4	4	5	45	4 50
28 "	0	1	1	2	2	3	3	4	4	5	47	4 67
29 "	0	1	1	2	2	3	3	4	4	5	48	4 83
1 Mon.	1	1	2	2	3	3	4	4	5	5	50	5 00
2 "	1	2	3	4	5	6	7	8	9	10	1 00	10 00
3 "	2	3	5	6	8	9	11	12	14	15	1 50	15 00
4 "	2	4	6	8	10	12	14	16	18	20	2 00	20 00
5 "	3	5	8	10	13	15	18	20	23	25	2 50	25 00
6 "	3	6	9	12	15	18	21	24	27	30	3 00	30 00
7 "	4	7	11	14	18	21	25	28	32	35	3 50	35 00
8 "	4	8	12	16	20	24	28	32	36	40	4 00	40 00
9 "	5	9	14	18	23	27	32	36	41	45	4 50	45 00
10 "	5	10	15	20	25	30	35	40	45	50	5 00	50 00
11 "	6	11	17	22	28	33	39	44	50	55	5 50	55 00
1 Year.	6	12	18	24	30	36	42	48	54	60	6 00	60 00

Rate of Annual Income of Investments,

PAR VALUE BEING $100, BEARING INTEREST AT

Price paid.	5%	6%	7%	8%	10%	Price paid.	5%	6%	7%	8%	10%
$50	10.00	12.00	14.00	16.00	20.00	$99	5.05	6.06	7.07	8.08	10.10
55	9.09	10.90	12.72	14.55	18.18	100	5.00	6.00	7.00	8.00	10.00
60	8.33	10.00	11.66	13.33	16.66	101	4.95	5.94	6.93	7.92	9.90
65	7.69	9.23	10.76	12.30	15.38	102	4.90	5.88	6.86	7.84	9.80
70	7.14	8.57	10.00	11.42	14.28	103	4.85	5·82	6.79	7.76	9.70
75	6.66	8.00	9.33	10.66	13.35	104	4.80	5.76	6.73	7.69	9.61
80	6.25	7.50	8.75	10.00	12.50	105	4.76	5.71	6.66	7.61	9.52
82½	6.06	7.27	8.48	9.69	11.12	110	4.54	5.45	6.36	7.27	9.09
85	5.88	7.05	8.23	9.41	11.76	115	4.34	5.21	6.08	6.95	8.69
87½	5.71	6.85	8.00	9.14	11.42	120	4.16	5.00	5.83	6.66	8.33
90	5.55	6.66	7.77	8.88	11.11	125	4.00	4.80	5.60	6.40	8.00
92½	5.40	6.48	7.56	8.64	10.80	130	3.84	4.61	5.38	6.15	7.69
95	5.26	6.31	7.36	8.42	10.52	135	3.70	4.44	5.18	5.92	7.40
96	5.20	6.25	7.29	8.33	10.41	140	3.57	4.28	5.00	5.71	7.14
97	5.15	6.18	7.21	8.24	10.30	145	3.44	4.13	4.82	5.51	6.89
97½	5.12	6.15	7.17	8.20	10.25	150	3.33	4.00	4.66	5.33	6.66
98	5.10	6.12	7.14	8.16	10.20						

Interest Rules.

FOUR PER CENT.—Multiply the principal by the number of days to run; separate the right hand figure from product, and divide by 9.

FIVE PER CENT.—Multiply by number of days, and divide by 72.

SIX PER CENT.—Multiply by number of days; separate right hand figure, and divide by 6.

SEVEN AND THREE-TENTHS PER CENT.—Multiply by number of days, and double the amount so obtained. On $100 the interest is just two cents per day.

EIGHT PER CENT.—Multiply by the number of days, and divide by 45.

NINE PER CENT.—Multiply by number of days; separate right hand figure, and divide by 4.

TEN PER CENT.—Multiply by number of days, and divide by 36.

TWELVE PER CENT.—Multiply by number of days; separate right hand figure, and divide by 3.

Bills of Exchange, Drafts, Acceptances.

A Bill of Exchange or Draft is an order drawn by one person or firm upon another, payable either at sight or at a stated future time.

It becomes an Acceptance when the party upon whom it is drawn writes across the face "Accepted," and signs his name thereto, and is negotiabie and bankable the same as a note, and subject to the same laws.

In many States both Sight and Time Drafts are entitled to three days grace, the same as notes; but if made in the form of a bank check, "pay to," without the words "at sight," it is payable on presentation without grace.

Demand Notes are payable on presentation without grace, and bear legal interest, after a demand has been made, if not so written. An Endorser on a demand note is holden only for a limited time, variable in different States.

A Negotiable Note must be made payable either to bearer or be properly Endorsed by the person to whose order it is made. If the Endorser wishes to avoid responsibility he can Endorse "without recourse."

A Joint Note is one signed by two or more persons, who each become liable for the whole amount.

Three days grace are allowed on all time notes after the time for payment expires; if not then paid the Endorser, if any, should be legally notified, to be holden.

Foreign Exchange, Value of U. S. Coins, etc.

The value of One Pound Sterling or an English Sovereign, compared with old U. S. coins, is $4.444, but Congress has from time to time reduced the weight and purity of U. S. coins, making their value as metals less than their value as coins, and has established the present legal value of a Pound Sterling at ~~$4.84~~ $4.8665 9½ per cent. premium, it is then at par value; when below 9½ per cent., it is below par; when above 9½ per cent., above par., etc.

Copartnerships.

Partnerships may be either general or special. In general partnerships money invested ceases to be individual property. Each member is made personally liable for the whole amount of debts incurred by the company. The company is liable for all contracts or obligations made by individual members.

Special partners are not liable beyond the amount contributed.

A person may become a partner by allowing people generally to presume that he is one, as, by having his name on the sign, or parcels, or in the bills used in the business.

A share or specific interest in the profits or loss of a business, as remuneration for labor, may involve one in the liability of a partner.

In case of bankruptcy, the joint estate is first applied to the payment of partnership debts, the surplus only going to the creditors of the individual estate.

A dissolution of partnership may take place under express stipulations in the articles of agreement, by mutual consent, by the death or insanity of one of the firm, by award of arbitrators, or by court of equity in cases of misconduct of some member of the firm.

A partner signing his individual name to negotiable paper, which is for the use of the partnership firm, binds all the partners thereby. Negotiable paper of the firm, even though given on private account by one of the partners, will hold all the partners of the firm when it passes into the hands of holders who are ignorant of the fact attending its creation.

Partnership effects may be bought and sold by a partner. He may make contracts; may receive money; indorse, draw, and accept bills and notes; and while this may be for his own private account, if it apparently be for the use of the firm, his partners will be bound by his action, provided the parties dealing with him were ignorant of the transaction being on his private account; and thus representation or misrepresentation of a partner, having relation to business of the firm, will bind the members in the partnership.

In case of death, the surviving partners must account to the representatives of the deceased.

Roofing Slate.

GENERAL RULE FOR THE COMPUTATION OF SLATE.

From the length of the slate take three inches, or as many as the third covers the first; divide the remainder by 2, and multiply the quotient by the width of the slate, and the product will be the number of square inches in a single slate. Divide the number of square inches thus procured by 144, the number of square inches in a square foot, and the quotient will be the number of feet and inches required. A square of slate is what will cover 100 feet square, when properly laid on the roof.

TABLE OF SIZES AND NUMBER OF SLATES IN ONE SQUARE.

Size in Inches.	No. of Slate in a Square.	Size in Inches.	No. of Slate in a Square.	Size in Inches.	No. of Slate in a Square.	Size in Inches.	No. of Slate in a Square
6 x 12	533	9 x 14	291	10 x 18	192	11 x 22	137
7 x 12	457	10 x 14	261	11 x 18	174	12 x 22	126
8 x 12	400	12 x 14	218	12 x 18	160	14 x 22	108
9 x 12	355	8 x 16	277	14 x 18	137	12 x 24	114
10 x 12	320	9 x 16	246	10 x 20	169	14 x 24	98
12 x 12	266	10 x 16	221	11 x 20	154	16 x 24	86
7 x 14	374	12 x 16	185	12 x 20	141	14 x 26	89
8 x 14	317	9 x 18	213	14 x 20	121	16 x 26	78

The weight of a square of Slate is estimated in a general way (varying according to the thickness of the different makes) at from 600 to 700 lbs. per square.

Sizes of Tanks and Contents.

Diameter.	Depth.	Gallons.	Diameter.	Depth.	Gallons.
Feet.	Feet.		Feet.	Feet.	
12	8	6,767	24	12	40,607
14	9	10,363	26	13	51,628
16	9	13,535	28	14	64,481
18	10	19,034	30	15	79,310
20	10	23,499	32	16	96,253
22	11	31,277	34	17	115,451

Capacity of Cisterns and Reservoirs in Gallons

DEPTH 10 INCHES; DIAMETER FROM 2 TO 25 FEET.

2 feet .	19.5	4 feet .	78.33	6 feet .	176.25	8 feet .	313.33	10 feet .	489.20	14 feet .	959.6
2½ " .	30.6	4½ " .	99.14	6½ " .	266.85	8½ " .	353.72	11 " .	592.40	15 " .	1,101.6
3 " .	44.06	5 " .	122.40	7 " .	239.88	9 " .	396.56	12 " .	705.	20 " .	1,958.4
3½ " .	59.97	5½ " .	148.10	7½ " .	275.40	9½ " .	461.40	13 " .	827.4	25 " .	3,059.9

CAPACITY OF BOXES.—A box 24 inches long by 16 inches wide, and 28 inches deep, will contain a barrel (3 bushels).

A box 24 inches long by 16 inches wide, and 14 inches deep, will contain half a barrel.

A box 16 inches square and 8.4 inches deep, will contain one bushel.

A box 8 inches by 8.4 inches square, and 8 inches deep, will contain one peck.

A box 8 inches by 8 inches square, and 4.2 inches deep, will contain one gallon.

Quantity of Seed Required

TO PRODUCE A GIVEN NUMBER OF PLANTS AND SOW A GIVEN AMOUNT OF GROUND.

	Quantity per acre.		Quantity per acre.
Artichoke, 1 oz. to 500 plants	½ lb.	Hemp	½ bu.
Asparagus, 1 oz. to 200 plants	5 lbs.	Kale, 1 oz. to 3,000 plants	4 oz.
Barley	2½ bu.	Kohl, Rabi, 1 oz. to 200 feet of drill	1½ lbs.
Beans, dwarf, 1 quart to 150 feet of drill	1¼ "	Leek, 1 oz. to 250 feet of drill	4 "
Beans, pole, 1 quart to 200 hills	½ "	Lettuce, 1 oz. to 250 feet of drill	3 "
Beet, garden, 1 oz. to 100 feet of drill	10 lbs.	Martynia, 1 oz. to 50 feet of drill	10 "
Beet, Mangel, 1 oz. to 150 feet of drill	6 "	Melon, Musk, 1 oz. to 100 hills	1¾ "
Brocoli, 1 oz. to 3,000 plants	5 oz.	Melon, Water, 1 oz. to 25 hills	1½ "
Broom Corn	10 lbs.	Nasturtium, 1 oz. to 50 feet of drill	10 "
Brussels Sprouts, 1 oz. to 3,000 plants	5 "	Oats	2½ bu.
Buckwheat	½ bu.	Okra, 1 oz. to 50 feet of drill	10 lbs.
Cabbage, 1 oz. to 3.000 plants	5 oz.	Onion Seed, 1 oz. to 200 feet of drill	5 "
Carrot, 1 oz. to 250 feet of drill	2½ lbs.	" " for Sets	30 "
Cauliflower, 1 oz. to 3,000 plants	5 oz.	Onion Sets, 1 quart to 20 feet of drill	8 bu.
Celery, 1 oz. to 10,000 plants	4 "	Parsnip, 1 oz. to 250 feet of drill	5 lbs.
Clover, Alsike and White Dutch	6 lbs.	Parsley, 1 oz. to 250 feet of drill	8 "
" Lucerne, Large Red and Crimson Trefoil	8 "	Peas, garden, 1 quart to 150 feet of drill	1½ bu.
" Medium	10 "	" field	2½ "
Collards, 1 oz. to 2,500 plants	6 oz.	Pepper, 1 oz. to 1,500 plants	4 oz.
Corn, sweet, 1 quart to 500 hills	8 qts.	Potatoes	8 bu.
Cress, 1 oz. to 150 feet of drill	8 lbs.	Pumpkin, 1 quart to 300 hills	4 qts.
Cucumber, 1 oz. to 80 hills	1¼ "	Radish, 1 oz. to 150 feet of drill	8 lbs.
Egg Plant, 1 oz. to 2,000 plants	8 oz.	Rye	1½ bu.
Endive, 1 oz. to 300 feet of drill.	3 lbs.	Salsify, 1 oz. to 60 feet of drill	8 lbs.
Flax, broadcast	½ bu.	Spinach, 1 oz. to 150 feet of drill	10 "
Garlic, bulbs, 1 lb. to 10 feet of drill		Summer Savory, 1 oz. to 500 feet of drill	2 "
Gourd, 1 oz. to 25 hills	2½ "	Squash, summer, 1 oz. to 40 hills.	2 "
Grass, Blue Kentucky	2 "	" winter, 1 oz. to 10 hills	3 "
" Blue English	1 "	Tomato, 1 oz. to 3,000 plants	3 oz.
" Hungarian and Millet	½ "	Tobacco, 1 oz. to 5,000 plants	2 "
" Mixed Lawn	3 "	Turnip, 1 oz. to 250 feet of drill	1½ lbs.
" Orchard, Perennial Rye, Red Top, Fowl Medow and Wood Medow	2 "	Vetches	2 bu.
		Wheat	1 to 2 bu.

Measuring Building Materials.

The following figures are worth remembering, as they will save a good deal of calculation and give approximately accurate results with a minimum of labor:

A cord of stone, three bushels of lime and a cubic yard of sand will lay 100 cubic feet of wall.

Five courses of brick will lay 1 foot in height on a chimney.

Nine bricks in a course will make a flue 8 inches wide and 20 inches long, and 8 bricks in a course will make a flue 8 inches wide and 16 inches long.

Eight bushels of good lime, 16 bushels of sand, and 1 bushel of hair will make enough mortar to plaster 100 square yards.

One-fifth more siding and flooring is needed than the number of square feet of surface to be covered, because of the lap in the siding and matching of the floor.

One thousand laths will cover 70 yards of surface, and 11 pounds of nails will nail them on.

One thousand shingles laid 4 inches to the weather will cover 100 square feet of surface, and 5 pounds of shingle nails will fasten them on.

Comparative Values of Woods for Fuel.

Taking shellbark hickory as the highest standard, and calling that 100, other trees will compare with it for burning purposes, as follows: shellbark hickory, 100; pignut hickory, 95; white oak, 84; white ash, 77; dogwood, 75; scrub oak, 73; white hazel, 72; apple tree, 70; white beech, 69; black birch, 65; hard maple, 65; black walnut, 62; yellow oak, 60; white elm, 58; red oak, 56; red cedar, 56; wild cherry, 55; yellow pine, 54; chestnut, 52; yellow poplar, 51; butternut, 43; white birch, 43; white pine, 30.

Strength of Ice.

Ice 2 inches thick will bear men on foot; 4 inches, men on horseback; 6 inches thick will bear cattle and teams with light loads; 8 inches thick, teams with heavy loads; 10 inches will sustain a pressure of 1,000 pounds per square foot. The above is on the supposition that the ice is sound, and not "snow ice."

To Ascertain the Amount of Paint Required to Cover a Given Surface.

RULE.—Multiply the distance around the building by the average height. Dividing this by 9 gives the number of square yards to be painted. This, divide again by 25 (1 gallon covering 25 square yards, 2 coats), gives the number of gallons required for 2 coats. If the building is of different heights find the surface of each and add together.

Tempering Steel.

[HASWELL.]

Steel in its hardest state being too brittle for most purposes, the requisite strength and elasticity are obtained by tempering—or *letting down the temper*, as it is termed—which is performed by heating the hardened steel to a certain degree and cooling it quickly. The requisite heat is usually ascertained by the color which the surface of the steel assumes from the film of oxide thus formed.

The degrees of heat to which these several colors correspond are as follows:

At 430—A very faint yellow At 450—A pale straw color	Suitable for hard instruments; as hammer-faces, drills, &c.
At 470—A full yellow At 490—A brown color	For instruments requiring hard edges without elasticity; as shears, scissors, turning tools, &c.
At 510—Brown, with purple spots At 530—Purple	For tools for cutting wood and soft metals; such as plane-irons, knives, &c.
At 550—Dark Blue At 560—Full Blue	For tools requiring strong edges, without extreme hardness as cold-chisels, axes, cutlery, &c.
At 600—Grayish blue, verging on black	For spring-temper, which will bend before breaking; as saws, sword-blades, &c.

Tempering Steel—Continued.

[HASWELL.]

If the steel is heated higher than this, the effect of the hardening process is destroyed. It has been stated that the temperature of furnaces, etc., may be estimated with considerable accuracy by the color of the fire, and that with a little practice the error at very high temperatures will not exceed 90° or 100°, and the following table contains the result of observations with an air thermometer.

Color of Fire.	Temperature, Degrees F.
Red, just visible	977
" dull	1,290
" cherry, dull	1,470
" " full	1,650
" " clear	1,830
Orange, deep	2,010
" clear	2,190
White heat	2,370
" bright	2,550
" dazzling	2,730

Effect of Heat on Various Bodies.

	Degrees.
Ammonia boils	140
Ammonia (liquid) freezes	—46
Antimony melts	951
Arsenic melts	365
Bismuth melts	476
Blood (human), heat of	98
" " freezes	25
Brandy freezes	—7
Brass melts	1,900
Cadmium melts	600
Coal Tar boils	325
Cold, greatest artificial	—166
" greatest natural	—56
Common fire	790
Copper melts	2,548
Glass melts	2,377
Gold (fine) melts	2,590
Gutta-percha softens	145
Heat, cherry red	1,500
" " (Daniel)	1,141
" bright red	1,860
" red, visible by day	1,077
" white	2,900
Ice melts	32
Iron (cast) melts	3,479
" (wrought) melts	3,980
Iron, bright red in the dark	752
" red hot in twilight	884
Lead melts	504
Mercury boils	662
" volatilizes	680
" freezes	—39
Naphtha boils	186
Petroleum boils	306
Platinum melts	3,080
Potassium melts	135
Proof Spirit freezes	—7
Saltpetre melts	600
Sea-water freezes	28
Silver (fine) melts	1,250
Snow and Salt, equal parts	0
Spirits of Turpentine freezes	14
Steel melts	2,500
" polished, blue	580
" " straw color	460
Strong Wines freeze	20
Sulphur melts	226
Sulph. Acid (spec. gravity, 1,641) freezes	—45
Tin melts	421
Vinous fermentation	60 to 77
Water in *vacuo* boils	98
Zinc melts	740

The sign — before the figures indicates that many degrees below zero or 0.

Specific Gravity and Weight of Metals and Alloys.

	Specific Gravity.	Weight of a Cubic foot.	Weight of a Cubic Inch.
		Lbs.	Lbs.
Aluminium, cast	2,560	160	.092
Antimony, cast	6,710	419	.243
Arsenic	5,760	.....	.208
Bismuth, cast	9,822	613	.353
Brass, cast	7,800	500	.280
Brass, rolled	8,400	527	.304
Bronze (Copper 8, Tin 1) Gun Metal	8,390	525	.302
Copper, cast	8,460	528	.305
" rolled	8,750	543	.315
" wire	8,800	548	.317
Gold, pure, cast, 24 carat	8,850	553	.321
" " hammered, 24 carat	19,258	1,204	.696
Iron, cast purest is common average	19,500	1,217	.702
" wrought heaviest " "	7,210	450	.260
Lead, cast	7,770	485	.280
" rolled	11,300	708	.408
Mercury, 40°	11,410	712	.411
" 32°	15,630	978	.566
" 60°	13,610	848	.492
" 212°	13,580	846	.490
Nickel, Plate	13,375	836	.483
Platinum, hammered	8,800	509	.318
" native, in grains	21,500	1,343	.775
Silver, pure, cast	17,500	.....	.....
" " hammered	10,474	654	.378
Steel (Carbon lightens it)	10,510	655	.379
Tin	7,850	490	.283
Zinc	7,290	455	.262
	7,000	437	.252

Brass, rolled ..... about
Bronze (Copper 8, Tin 1) Gun Metal ..... "
Gold, pure, cast, 24 carat ..... about
" " hammered, 24 carat ..... about
Platinum, hammered ..... about
" native, in grains ..... "
Steel (Carbon lightens it) ..... common average
Tin ..... "
Zinc ..... "

Customary and Legal Weight of Various Articles in the United States.

		Lbs.
Apples	per bushel	48
" dried	"	24
Barley	"	48
Beans	"	60
Buckwheat	"	48
Broom Corn	"	46
Blue Grass, Kentucky	"	14
" " English	"	24
Bran	"	20
Canary Seed	"	60
Castor Beans	"	46
Clover Seed	"	64
Corn, shelled	"	56
" on ear	"	70
Corn Meal	"	50
Charcoal	"	22
Coal, Mineral	"	80
Cranberries	"	40
Dried Peaches	"	28
Flax Seed	"	55
Hemp Seed	"	44
Hungarian Grass Seed	"	50
Irish Potatoes, heaping measure	"	60
Millet	"	50
Malt	"	34
Oats	"	32
Osage Orange	"	33
Orchard Grass	"	14
Onions	per bushel	56
Peas	"	60
Plastering Hair	"	8
Rape	"	50
Rye	"	56
Red Top Seed	"	14
Salt, coarse	"	50
Salt, Michigan	"	56
Sweet Potatoes	"	56
Timothy Seed	"	45
Turnips	"	55
Wheat	"	60
Beef and Pork, per bbl., net		200
Flour, per bbl., net		196
White Fish and Trout, per bbl., net		200
Salt, per bbl.		280
Lime, "		220
Hay, well settled, per cubic ft.		$4\frac{1}{2}$
Corn, on cob, in bin "		$22\frac{1}{2}$
Corn, shelled " "		45
Wheat " "		48
Oats " "		$25\frac{1}{2}$
Potatoes " "		$38\frac{1}{2}$
Sand, dry " "		$95\frac{1}{2}$
Clay, compact "		135
Marble "		169
Seasoned Beech Wood, per cord		5,616
" Hickory, "		6,960

Specific Gravity and Weight

TO CUBIC FOOT OF VARIOUS MATERIALS.

Timber.	Specific Gravity.	Weight per Cubic foot in pounds.
Ash	.8	50
Beech	.69	43
Birch	.71	44
Cedar	.48	31
Deal, Christ'na	.7	44
Elm	.6	37
Hornbeam	.75	47
Larch	.55	35
Memel	.6	37
Mahogany, Spanish	.8	50
Oak, English	.93	58
Oak, Canadian	.87	54
Pine, Red	.65	41
Pine, Yellow	.45	29
Teak, Moulm'n	.65	41
Yew	.8	50
Miscellaneous.		
Asphaltum	.9	56
Gutta-Percha	.98	61
India Rubber	.94	60
Ivory	1.8	112

Fluids.	Specific Gravity.	Weight per cubic foot in pounds.
Alcohol	.8	50
Ether	.74	46
Oil	.90	56
Water, Fresh	1.000	62.4
Water, Sea	1.028	64.1
Artificial Substances.		
Brick	2.0	124
Brickwork, in mortar.	1.6	100
Brickwork, in cement	1.8	112 to 94
Concrete, ordinary	1.9	119
Concrete, in cement	2.2	133
Cement, Portland,	1.3	81
Cement, Roman	1.	63
Glass	2.5	156
Lime, quick	.8	50
Mortar	1.7	106
Tile	1.8	112

Stones, Earths, etc.	Specific Gravity.	Weight per Cubic foot in pounds.
Chalk	2.3	243
Clay	2.	125
Coal	1.3	82
Coke	.8	50
Earth, Rammed	1.6	100
Flint	2.6	163
Gravel	1.9	120
Granite	2.6	164
Grindstone	2.1	131
Limestone	2.5	156
Marble	2.7	168
Sand	1.9	120
Sandstone	2.5	156
Stone, Bath	1.8	112
Stone, Portland	2.1	131
York Flag	2.3	143
Slate	2.8	175
Shingle	1.4	90

Weight of a Cubic Foot of Various Substances,

IN POUNDS.

Metals.	
Brass	489.
Gun Metal	543.
Copper	545.
Cast Iron	450.
Wrought iron	482.
Lead	710.
Mercury	849.
Steel	486.
" Plates	452.
Tin	455.
Zinc, Cast	428.
" Rolled	450.

Wood, Etc.	
Live Oak	66.75
Hickory	95.5
Pine, White	34.
Spruce	31.25
Corkwood	15.
Fire Brick	137.
Coal, Anthracite	93.
" Bituminous	80.
Coal, Cannel	94.
Cotton, Bale	14.
" Pressed	22.
Earth, Loose	94.
" Mud	102.
Common Soil	137.
Hay, Bale	9.5
" Pressed	25.

WORKSHOP RECIPES.

Cement to Resist Fire and Water, and Harden Quickly.—Two parts finely sifted unoxidized iron filings. One part, perfectly dry, finely powdered loam. Knead the mixture with strong vinegar into a homogeneous plastic mass, to be used as soon as made.

To Soften Putty.—To remove old putty from broken windows, dip a small brush in nitro-muriatic acid or caustic soda (concentrated lye), and with it annoint or paint over the dry putty that adheres to the broken glass and frames of your windows; after an hour's interval, the putty will have become so soft as to be easily removable.

Painter's Putty.—Spanish whiting, pulverized, 80.6; Boiled oil, 20.4. Made into a stiff paste. If not intended for immediate use, raw oil should be used. One pound of putty for stopping every 20 yards.

Glazier's Putty.—Whiting, 70 pounds; boiled oil, 30 pounds; water, 2 gallons. Mix. If too thin add more whiting; if too thick, add more oil.

Cement for Stopping Joints, Etc.—White lead in oil, mixed with enough white sand to make it a stiff paste. This grows hard by exposure, and resists heat, cold and water.

Cement for Leather Belting.—Take of common glue and American isinglass, equal parts; place them in a boiler and add water sufficient to cover the whole· Let it soak 10 hours, then bring it to a boiling heat, and add pure tannin until the whole becomes ropey or appears like the whites of eggs. Apply it warm. Buff the grain off the leather where it is to be cemented; rub the joint surfaces solidly together, let it dry a few hours, and it is ready for practical use; and, if properly put together, it will not need riveting, as the cement is nearly of the same nature as the leather itself.

To Remove Rusty Bolts.—To remove bolts that have become rusted badly, without breaking them, is quite simple if understood. The best method is to apply kerosene oil liberally, and give time for it to soften the rust before any attempt is made to turn the nut. If, after the rust has softened, it does not start easily with the wrench, give a rap on one corner with a blow of the hammer. A hammer and cold chisel rightly used will often start a rusted nut that would not yield to the wrench without twisting off the bolt.

How to Prepare Fence Posts.—A western farmer says that he discovered many years ago that wood could be made to last longer than iron in the ground. Time and weather, he says, seem to have no effect on it. Posts can be prepared for less than two cents apiece. This is the recipe. Take boiled linseed oil and stir it in pulverized charcoal to the consistency of paint. Put a coat of this over the timber, and, he adds, there is not a man that will live to see it rot.

A Practical Rule for Laying Pipe for Draining Land.

Soils.	Depth of Pipe.	Distance apart.	Soils.	Depth of Pipe.	Distance apart.
Coarse Gravel Sand	4 feet 6 inches	60 feet.	Loam with Gravel	3 feet 3 inches	27 feet.
Light Sand with Gravel	4 feet	50 feet.	Sandy Loam	3 feet 9 inches	40 feet.
Light Loam	3 feet 6 inches	33 feet.	Soft Clay	2 feet 9 inches	21 feet.
Loam with Clay	3 feet 2 inches	21 feet.	Stiff Clay	2 feet 6 inches	15 feet.

Greatest Fall of Rain is 2 inches per hour=54308.6 galls. per acre.

TABLES.

WEIGHTS AND MEASURES.

AVOIRDUPOIS WEIGHT.

Used in Commercial Transactions generally, and in weighing Metals, except Gold and Silver.

16 drams	= 1 ounce.	100 pounds	= 1 quintal.
16 ounces	= 1 pound.	196 pounds	= 1 barrel flour.
14 pounds	= 1 stone.	200 pounds	= 1 barrel beef or pork.
25 pounds	= 1 quarter.	280 pounds	= 1 barrel salt.
4 quarters	= 1 hundred weight.	1 pound avoirdupois	= 7000 grains Troy.
20 hundred weight	= 1 ton.	144 pounds avoirdupois	= 175 pounds Troy.

At the custom-house, and in some commercial transactions, 28 pounds are equal to 1 quarter; 112 pounds are equal to 1 cwt.; and 2240 pounds are equal to 1 ton

WEIGHTS AND MEASURES—Continued.

TROY WEIGHT.

Used in weighing Gold, Silver, Jewelry, etc.

24 grains	= 1 pennyweight, marked *pwt.*	240 pennyw'hts = 12 ounces = 1 pound, marked *lb.*
20 pennyweights	= 1 ounce, " *oz.*	1 pound Troy = 5760 grains.

APOTHECARIES' WEIGHT.

Used in compounding Medicines. Drugs and medicines are bought and sold by avoirdupois weight.

20 grains	= 1 scruple, marked ℈	8 drams	= 1 ounce, marked ℥
3 scruples	= 1 dram, " ʒ	12 ounces	= 1 pound, " lb

℈, a scruple; ℈ss, half a scruple; ℈i, one scruple; ℈iss, one scruple and a half; ℈ij, two scruples, &c. So of ʒ, a dram, and ℥, an ounce.

DIAMOND WEIGHT.

Applied to the Weighing of Diamonds.

16 parts	= 1 grain.	1 carat	= $3\frac{1}{6}$ grains Troy (nearly).
4 grains	= 1 carat.	$151\frac{1}{2}$ carats	= 1 ounce Troy.

LONG MEASURE.

This Measure is used in measuring Lines or Distances when Length only is considered.

3	barley corns = 1 inch.	$3\frac{9}{20}$	statute miles = 1 league.
12	lines = 1 inch.	60	geographical miles = 1 degree.
12	inches = 1 foot.	$69\frac{1}{6}$	statute miles = 1 equatorial deg. (nearly).
3	feet = 1 yard.	360	degrees = circumference of the earth.
$16\frac{1}{2}$	feet, or $5\frac{1}{2}$ yards = 1 rod, perch or pole.	3	inches = 1 palm.
40	rods = 1 furlong.	4	inches = 1 hand.
8	furlongs = 320 rods = 1760 yards = 5280 feet = 1 statute mile.	9	inches = 1 span.
$1\frac{3}{20}$	statute miles = 1 geographical mile.	$1\frac{1}{2}$	feet = 1 cubit (Scripture).
		6	feet = 1 fathom.

SQUARE MEASURE.

This Measure is used in measuring Surfaces, as Land, the Floors and Sides of Buildings, &c.

144	sq. inches = 1 sq. foot.	4	roods = 160 sq. rods = 4840 sq. yds = 43560 sq. feet = 1 acre.
9	sq. feet = 1 sq. yard.	640	acres = 1 sq. mile, or 1 sq. section.
$72\frac{1}{4}$	sq. feet = 1 sq. rod, perch or pole.	36	sq. sections = 1 township, 6 miles sq.
$30\frac{1}{4}$	sq. yards = 1 sq. rod.		
40	sq. rods = 1 rood.		

SURVEYORS' MEASURE.

Used in the Measure of Distances and the Area of Surfaces.

7.92	inches = 1 link.	320	rods = 1 mile.
25	links = 1 rod or pole.	625	square links = 1 square rod.
100	links = 4 rods = 1 chain.	16	square rods = 1 square chain.
80	chains = 1 mile.	10	square chains = 1 square acre.

SOLID OR CUBIC MEASURE.

Used in Measuring Solid Bodies and Spaces having Length, Breadth and Thickness, or Depth; as Timber, Stone, Wood, Ships, &c.

1728	cubic inches = 1 cubic foot.	40	cubic feet = 1 ton, U. S. shipping.
27	cubic feet = 1 cubic yard.	42	cubic feet = 1 ton, British shipping.
16	cubic feet = 1 cord ft. of wood.	40	ft. of round timber, or 50 ft. of hewn timber, = 1 ton or load.
128	cubic feet, or 8 cord feet = 1 cord of wood.		
$16\frac{1}{2}$	cubic feet = 1 perch.		

CLOTH MEASURE.

Used by Dealers in Cloth, Carpets, Ribbons, &c.

$2\frac{1}{4}$	inches = 1 nail.	36	inches = 4 qrs. = 1 yard.
9	inches = 4 nails = 1 quarter.	45	inches = 5 qrs. = 1 ell English.
27	inches = 3 qrs. = 1 ell Flemish.	54	inches = 6 qrs. = 1 ell French.

WEIGHTS AND MEASURES—Continued.

WINE MEASURE.

Used in Measuring Wine, Water, Cider, Oil and most other Liquids.

4 gills	=	1 pint	=	28⅞ cubic inches.	2 barrels	=	63 gallons = 1 hogshead.
2 pints	=	1 quart	=	57¾ cubic inches.	4 barrels	=	126 gallons = 1 pipe.
4 quarts	=	1 gallon	=	231 cubic inches.	2 pipes	=	252 gallons = 1 tun.
10 gallons	=	1 anker.			42 gallons	=	1 tierce.
31½ gallons	=	1 barrel.			2 tierces	=	84 gallons = 1 puncheon.

In some States of the United States the barrel for cider is fixed at 32 gallons.

ALE OR BEER MEASURE.

Applicable to the Measuring of Ale and Beer.

2 pints	=	1 quart	=	70½ cubic inches.	2 kilderkins	=	36 gallons = 1 barrel.
4 quarts	=	1 gallon	=	282 cubic inches.	3 kilderkins	=	54 gallons = 1 hogshead.
36 quarts	=	9 gallons	=	1 firkin.	4 kilderkins	=	72 gallons = 1 puncheon
2 firkins	=	18 gallons	=	1 kilderkin.	6 kilderkins	=	108 gallons = 1 butt.

DRY MEASURE.

Applicable to all articles not Liquid, bought and sold by Measure; such as Grain, Salt, Coal, &c.

2 pints	=	1 quart	=	67⅕ cubic inches.	The English or imperial *struck* bushel	=	2218.192 cubic inches.
4 quarts	=	1 gallon	=	268⅘ cubic inches.	1 imperial bushel	=	1.0315 + U. S. bush.
8 quarts	=	2 gallons	=	1 peck.	3 imperial bushels	=	1 English Sack.
4 pecks	=	1 bushel.			8 imperial bushels, or 8¼ U. S. bushels (nearly)	=	1 English quarter.
8 bushels	=	1 quarter.			5 English quarters	=	1 English load.
36 bushels	=	1 chaldron.					
An *even* and *struck* Winchester (or U. S. bushel	=	2150.42 cubic inches.					

TONNAGE.

1 register ton	=	100 cubic feet.	42 cubic feet	=	1 British shipping ton, 32.719 imperial bushels, or 33.75 U. S. bushels.
40 cubic feet	=	1 U. S. shipping ton, 32,143 U. S. bushels, or 31.16 imperial bushels.	350 cubic feet	=	1 keel

APOTHECARIES MEASURE.

60 minims (*m*)	=	1 fluid drachm, marked *f*ʒ	16 fluid ounces	=	1 pint, marked 0
8 fluid drachms	=	1 fluid ounce, marked *f*ʒ	8 pints	=	1 gallon, marked *con*

MEASURE OF TIME.

Used in the Computation of Time.

60 seconds	=	1 minute.	4 weeks	=	1 month.
60 minutes	=	1 hour.	52 weeks, 1 day, and 6 hours	=	12 calendar months.
24 hours	=	1 day.	12 calendar months, or 365 days and 6 hours	=	1 Julian year.
7 days	=	1 week.			
2 weeks	=	1 fortnight.			

The time in which the earth, departing from one fixed star, returns again to the same star, is called the *sidereal* year, and is 365 days, 6 hours, 9 minutes, and $9\frac{6}{10}$ seconds. The *solar* or *tropical* year consists of 365 days, 5 hours, 48 minutes, $49\frac{7}{10}$ seconds, and is the time in which the sun, departing from some point in the ecliptic, returns to the same point again.

MEASURE OF CIRCULAR MOTION

Used in measuring Latitude, Longitude, etc.

60 seconds, or 60″	=	1 minute.	90 degrees	=	1 quadrant, or right angle.
60 minutes, or 60′	=	1 degree, or 1°	12 signs, or 360 degrees	=	1 great circle of the zodiac.
30 degrees	=	1 sign.			

WEIGHTS AND MEASURES—Continued.

PAPER AND BOOKS.

24 sheets	= 1 quire.	2 reams	= 1 bundle.
10½ quires	= 1 token.	10 reams	= 1 bale.
20 quires	= 1 ream.		

A BOOK FORMED OF SHEETS FOLDED

In 2 leaves, is a folio.	In 18 leaves, is an 18 mo.
In 4 leaves, is a quarto or 4to.	In 24 leaves, is a 24mo.
In 8 leaves, is an octavo or 8vo.	In 32 leaves, is a 32mo.
In 12 leaves, is a duodecimo or 12mo.	In 64 leaves, is a 64mo.
In 16 leaves, is a 16mo.	

NUMBERS.

12 units	= 1 dozen.	12 gross	= 144 dozen = 1 great gross.
144 units	= 12 dozen = 1 gross.	20 units	= 1 score.

THE METRIC SYSTEM.

WEIGHTS.

Metric Denominations and Values.				Equivalents in Denominations in Use.		
Names.		No. Grams.		Weight of what Quantity of Water at Maximum Density.		Avoirdupois Weight.
Millier or tonneau	=	1,000,000	=	1 cubic meter	=	2204.6 pounds.
Quintal	=	100,000	=	1 hectoliter	=	220.46 pounds.
Myriagram	=	10,000	=	10 liters	=	22.046 pounds.
Kilogram or kilo	=	1,000	=	1 liter	=	2.2046 pounds.
Hectogram	=	100	=	1 deciliter	=	3.5274 ounces.
Dekagram	=	10	=	10 c. centimeter	=	0.3527 ounce.
Gram	=	1	=	1 c. centimeter	=	15.432 grains.
Decigram	=	.1	=	.1 c. centimeter	=	1.5432 grains.
Centigram	=	.01	=	10 c. millimeter	=	0.1543 grain.
Milligram	=	.001	=	1 c. millimeter	=	0.0154 grain.

MEASURES OF LENGTH.

Metric Denominations and Values.				Equivalents in Denominations in Use.
Myriameter	=	10,000 meters	=	6.2137 miles.
Kilometer	=	1,000 meters	=	0.62137 mile, or 3,280 feet and 10 inches.
Hectometer	=	100 meters	=	328 feet and 1 inch.
Dekameter	=	10 meters	=	393.7 inches.
Meter	=	1 meter	=	39.37 inches.
Decimeter	=	.1 of a meter	=	3.937 inches.
Centimeter	=	.01 of a meter	=	0.3937 inch.
Millimeter	=	.001 of a meter	=	0.0394 inch.

MEASURES OF SURFACE.

Metric Denominations and Values.				Equivalents in Denomination in use.
Hectare	=	10,000 square meters	=	2.471 acres.
Arc	=	100 square meters	=	119.6 square yards.
Centare	=	1 square meter	=	1.550 square inches.

MEASURES OF CAPACITY.

Metric Denominations and Values.						Equivalents in Denominations in use.		
Names.		No. Liters.		Cubic Measure.		Dry Measure.		Wine Measure.
Kiloliter	=	1,000	=	1 cubic meter	=	1,308 cubic yards	=	264.17 gallons.
Hectoliter	=	100	=	.1 cubic meter	=	2 bushel, 3.35 pecks	=	26.417 gallons.
Decaliter	=	10	=	10 c. decimeters	=	9.08 quarts	=	2.6417 gallons.
Liter	=	1	=	1 c. decimeter	=	0.908 quart	=	1.0567 quarts.
Deciliter	=	.1	=	.1 c. decimeter	=	6.1022 cubic inch	=	0.845 gill.
Centiliter	=	.01	=	10 c. centimeters	=	0.6102 cubic inch	=	0.338 fluid oz.
Milliliter	=	.001	=	1 c. centimeter	=	0.061 cubic inches	=	0.27 fluid dr.

HALL & CARPENTER,

PHILADELPHIA,

SOLE IMPORTERS OF THE

"HALL'S G. D. C."

EXTRA HEAVILY COATED

TERNE PLATE,

Warranted to contain 38 lbs. Coating on each box of 28x20, and 19 lbs. on each box of 14x20.

THE BEST TERNE PLATE MANUFACTURED.

EVERY SHEET OF PRIME PLATE STAMPED AT THE WORKS.

ALSO THE CELEBRATED BRAND OF

"KILLEY BEST BEST CHARCOAL"

TERNE PLATE.

A VERY SUPERIOR QUALITY.

EVERY SHEET OF PRIME PLATE STAMPED AT THE WORKS.

ALSO

"HALL'S D. C. G."

EXTRA HEAVILY COATED

BRIGHT TIN.

THE BEST BRIGHT TIN IMPORTED.

TIN PLATE,

ANTIMONY,

PIG TIN,

BAR TIN,

PIG LEAD,

BAR LEAD,

PIG COPPER,

SPELTER,

YELLOW METAL,

SHEET ZINC,

BABBIT METAL,

BISMUTH.

RUSSIA SHEET IRON,

PATENT PLANISHED SHEET IRON,

CHARCOAL BLOOM SHEET IRON,

COMMON SHEET IRON,

REFINED SHEET IRON,

COLD ROLLED SHEET IRON,

CHARCOAL BLOOM GALVANIZED SHEET IRON,

REFINED GALVANIZED SHEET IRON,

EMBOSSED SHEET IRON,

REPUBLIC KALAMEIN SHEET IRON,

CORRUGATED SHEET IRON,

HOOP IRON,

ROUND IRON,

GALVANIZED HOOP IRON.

IRON WIRE,
COPPER COATED IRON WIRE,
STEEL WIRE,

GALVANIZED WIRE,
BRASS WIRE,
COPPER WIRE,

TINNED WIRE,
TINNED BROOM WIRE,
WIRE ON SPOOLS,

COPPER NAILS,
COPPER TACKS,
ZINC NAILS,

CASE NAILS,
WIRE NAILS,
GALVANIZED NAILS,

SHEATHING NAILS,
TINNED NAILS,
BLACK NAILS,

BAKE PANS,
STOVE ORNAMENTS,
MICA,
ELBOWS.

AGENTS FOR THE

AMERICAN SCREW CO.'S WARRANTED

Tinned Iron Rivets,

Tinned Belt Rivets

and Burrs,

Black Iron Rivets,

Coopers' Rivets,

Boiler Rivets,

Stove Rivets,

Stove Bolts,

Sink Bolts,

Wrought Nuts.

PATTERN SIZES FURNISHED TO ORDER.

SHEET BRASS, BRASS KETTLES,
LEAD RIVETS,

BRASS RIVETS & BURRS,
COPPER RIVETS & BURRS,
BRAZIERS' RIVETS,

Brass Tubing,

Copper Tubing,

Copper Bottoms,

METALLIC BOTTOMS.

PATTERN SIZES FURNISHED
TO ORDER.

Zinc Stove Boards,

Crystalized Stove Boards,

Granite Iron Ware,

Pearl Agate Ware,

Black Lead Crucibles,

Paste Polish,

FRANKLIN Stove Polish,
PHILADELPHIA

German Black Lead, —IN— BULK,

Charcoal,

Rosin,

Can Trimmings.

MANUFACTURERS OF

SOLDER

H. & C. SOLDER, (EXTRA FINE),

1-2 & 1-2 SOLDER,

OXFORD SOLDER,

NO. 1 REFINED SOLDER,

TRIANGLE SOLDER, DROP SOLDER,

WIRE SOLDER,

CAPPING SOLDER,

CAKE SOLDER.

OXFORD

METALLIC BROWN PAINT.

88 PER CENT. METALLIC BASE.

The metallic base of this paint is composed of the protoxide and peroxide of iron, Its properties are such as give it superiority over all others in the market for the purpose for which it is recommended.

It has been proved by thorough exposure, and by comparison with other paints, to be the only reliable paint to resist the action of salt water and salt atmosphere.

It is therefore specially recommended for ship-bottoms, hulls, decks, boiler fronts, smoke stacks, and steam pipes. For iron railings, fences, cars, railroad and other bridges it is not excelled.

It is especially adapted for

METAL ROOFS.

It is not affected by acids or gases, and is a perfect protector against rust on metals, and from dampness on brick walls.

It mixes and blends readily with other paints, and by comparison to the amount of surface a given weight will cover, costs about one-half as much as other metallic paints.

Wherever this paint has been used it has given entire satisfaction, which is, we believe, more than can be said of any other paint in the market.

For sale dry, finely powdered, in barrels; also, ground in pure linseed oil, in barrels and metallic kegs.

Also, a superior quality of venetian red.

MADE EXPRESSLY FOR

HALL & CARPENTER,

Importers of Tin Plate and Metals,

709 Market Street, Philadelphia.

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RITCHIE'S PATENT CORRUGATED PIPE.

RITCHIE'S PATENT SPIRAL LOCK SEAM PIPE.

RITCHIE'S DOUBLE SEAMED SPEAKING TUBE.

REPUBLIC KALAMEIN IRON.

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BROMBACHER'S ADJUSTABLE BAR FOLDERS.

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COVERT'S PATENT ADJUSTABLE SOLDER IRONS.

BUCKEYE PATENT REVOLVING VENTILATOR.

MOORE'S PATENT STATIONARY VENTILATOR.

GAS RETORT SOLDER IRON FURNACE.

WAX STRINGS.

TUTTLE & BAILEY'S REGISTERS.

AMERICAN SCREW CO.'S STOVE BOLTS AND RIVETS.

AMERICAN SCREW CO.'S WIRE NAILS.

EMBOSSED SHEET IRON AND ELBOWS.

BALTIMORE COPPER ROLLING CO.'S SHEET AND BOLT COPPER.

INDEX.

A

PAGE.

Agencies..... 322
Alloys, Specific Gravity and Weight of..... 307
Awls, Marking..... 98

B

PAGE.

Bakers Pearl, Retinned..... 133
Bakers Vienna, " 133
Bands, Stove Pipe, Nickel-plated..... 244
Banks, Toy, Japanned..... 169
Beaters, Egg, all Wire..... 211
" " Black Handle..... 211
" " Bryants..... 212
" " Dover..... 212
" " Red Handle..... 211
" " Tin Handle..... 211
Bills of Exchange, Drafts and Acceptances... 302
Blanks, Cullender..... 159
Boilers, Coffee..... 182
" Farina, Retinned..... 123
" Milk or Rice, Retinned..... 122
" " Seamless, Retinned..... 123
" Oval, Enameled..... 177
" " Plain..... 177
" " Tinned..... 177
" " Turned..... 177
" Round, Enameled..... 175
" " Plain..... 175
" " Tinned..... 175
" " Turned..... 175
" Wash 180
Bolts, Sink..... 258
" Stove, Flat Head..... 257
" " Round Head..... 258
Bottoms, Copper..... 262
" Cullender..... 161
" Steamer..... 158
" Tea Kettle Tin..... 159
" Wash Bowl..... 161
Bowls, Dipper, Plain..... 151
" " Retinned..... 144
" and Pitchers, Japanned..... 172
" Wash, Handled, Retinned..... 122
" " Plain..... 124–125
" " Retinned..... 151
Boxes, Bond, Japanned..... 168
" Bread, Embossed, Japanned..... 172
" Cake, Round, Japanned..... 167
" " Square, " 167
" Cash, Japanned..... 168
" Deed, " 168
" Dredge, " 170
" " Plain..... 170
" Pepper, Japanned..... 170
" Spice, " 168

PAGE.

Brace and Wire Bender..... 73
Brass, Planished..... 263
Brass Plates, Weigt per sq. foot..... 287–288–289
Breasts and Covers, Tea Kettle..... 159
" " " Copper..... 200
" " Tea Pot..... 160
Broilers, Henis..... 215
" Wire..... 209–210
" " Retinned..... 143
Brushes, Stove..... 229
" and Trays..... 167
Buckets, Chamber, Acme..... 193
" " Galvanized..... 193
" Covered..... 181
" Fire, Galvanized..... 186
" Milk or Water, Retinned..... 187
" Water, Seamless, Retinned..... 114
Burrs, Tinned or Black..... 257

C

PAGE.

Candlesticks, Bright..... 168–169
" Japanned..... 168–169
" Save All..... 168
Canisters, Tea or Coffee, Japanned..... 167
Can Stock, Iron Clad..... 184–185
Cans, Milk " 184
Cans, one inch deep, capacity of..... 278
" Oil, Glass..... 201
Canopies..... 162
Cases, Comb, Japanned..... 169
Chafers, Oyster, Retinned..... 148
Chisels, Cold..... 98
" Lantern..... 97
" Wire..... 97
Cisterns, capacity of..... 304
Cleaners, Pot..... 214
Cloth Strainer, Brass..... 232
Collars, Stove Pipe, Brass..... 230
" " " Tin and Japanned..... 161
" " " Zinc..... 230
Companions, Scholar's..... 170
Compositions and Receipts..... 279 to 285
Coolers, Water..... 173
" Stands..... 173
Copartnerships..... 303
Copper Bolt..... 264
Copper Bolt, Weight per foot..... 291–292
" Planished..... 262–263
" Plates, Weight per sq. foot..... 287–288–289
" Sheet, Stock Sizes..... 264
" Sheet, Weight per sq. foot..... 291
Covers, Bell Shape..... 161
" Boiler..... 159
" Bucket..... 158
" " Rimmed..... 161

PAGE.

Covers, Butter Kettle..... 158
" Cake Box or Lard Can..... 158
" Coffee Pot..... 160
" " " Rimmed..... 160
" Pot..... 158
" Steak, Retinned..... 148
Cullenders, Retinned..... 126
Cups, California, Plain..... 155
" Miners, Retinned..... 135
" Molasses, Japanned..... 172
" Muffin, Pearl, Retinned..... 137
" " Plain..... 156
" " Retinned..... 137
" " Turks Head, Retinned..... 137
" Register, Nickel-plated..... 230
" " Porcelain..... 230
" and Saucers, Toy, Retinned..... 133
" Stamped, Plain..... 155
" Stamped, Retinned.....133–134
" Teamsters, Plain..... 155
" Teamsters, Retinned..... 134
" Tin, Common..... 182
" Toy, Japanned..... 169
Cuspadores, Japanned..... 169
Cut-off, Rain Water, Howells..... 216
Cutters, Biscuit..... 163
" Cake..... 163
" Doughnut..... 163
" Slaw..... 217
" Tart..... 163
" Wire..... 98

D

PAGE.

Dampers, Stove Pipe..... 230
Decimal parts of a pound..... 290
Dippers, Brass..... 232
" Copper..... 232
" Cocoa Shaped, Retinned..... 146
" Cream, Retinned..... 146
" Cup " 145
" Flaring " 144–146
" Forged Handle, Retinned..... 145
" Laundry, Retinned..... 145
" Water, Plain..... 153
" " Retinned..... 144
Dishes, Pudding, Oblong, Retinned..... 131
" Soap, Retinned..... 149
Dividers..... 101
Drills, Breast..... 100

E

PAGE.

Ears, Brass..... 222
" Tin, Eureka Can..... 221
" Tin, Eureka Kettle..... 221
" Kettle, Malleable Heavy..... 221
" " Retinned..... 221
Edger, Roofing, W. C. Bells..... 80
Elbows, Adjustable, Tin or Galvanized..... 235
" Corrugated, Galvanized..... 234
" " Copper..... 234
" Embossed, Stove Pipe..... 244
" Speaking Tube, Tin..... 209
Extinguishers, Brass..... 218

F

PAGE.

Fastener, Conductor, Hall's Patent..... 235
Flasks, Coffee..... 182
Fluid, Soldering..... 249
Folders, Stow's Tin..... 5
" Wood, Roofing..... 99
Foreign Exchange..... 303
Forks, Flesh, Retinned..... 147
Frames, Ventilator, Buckeye..... 238
Freezers, Ice Cream.....204–205–206
Funnels, Corrugated..... 158
Furnace, Can Makers..... 106
" Tinners, Cast Iron..... 105
" " Gas..... 106
" " Gasoline..... 228
" " Sheet Iron..... 105

G

PAGE.

Gauge, Birmingham, value in inches..... 289
Gauge, Stow's..... 85
Gauges, Wire..... 103
" " Comparison of..... 289
" " Difference between..... 293
Gloss, Electric..... 249
Graters Box, Japanned..... 169
" Flat..... 182
" Iron Frame..... 232
Gravity Specific, and Weight to cubic foot of various materials..... 308
Gridirons, Retinned..... 143
Groovers, Hand..... 97
" Roofing..... 99
Gutters, Roof 8ft. long..... 240

H

PAGE.

Hammers, Planishing..... 86
" Raising..... 86
" Riveting..... 86
" Setting..... 86
Handles, Bucket..... 232
" Damper, Nickel Plated..... 231
" Dipper, Malleable..... 232
" " Plain..... 153
" " Retinned..... 144
" Dripping Pan..... 165
" and Ears, Tea Kettle, Copper..... 200
" Milk Can, Noiseless..... 186
" Saucepan, Retinned..... 137
" Solder Iron..... 102
" Tea Pot..... 231
Heads, Conductor..... 235
" Horn..... 163
" Sprinkler, Tin..... 218
" " Zinc..... 219
Heat, effect on various bodies..... 306
Hinges, Tea Pot..... 231
Hods, Coal.....194–195
Holder, Shears, Camp's..... 82
Horns, Blow..... 163

I

PAGE.

Ice, strength of..... 305
Interest, Rules..... 302
" Table..... 301

PAGE.

Iron, Boiler, Weight and Thickness..... 298
" " Pressure allowed by the laws of the United States..... 298
" Corrugated, Black or Galvanized....293–294
" Hoop, Galvanized..... 232
" Plates, Weight per sq. foot.....287–288–289
" Russia..... 295
" Sheet, Black..... 265
" " Black, Weight per sq. foot..... 293
" " Embossed..... 243
" " Galvanized..... 264
" " " Weight per sq. ft..... 293
" " Kalamein..... 252
Irons, Mrs. Potts.....202–203
" Solder, Adjustable..... 104
" " Riveted Handle..... 104

J

PAGE.

Jaggers, Paste, Retinned..... 148

K

PAGE.

Kettles, Brass..... 265
" Butter..... 181
" Copper..... 265
" Dinner, Retinned,..... 148
" Maslin, Enameled..... 178
" Preserving, Retinned..... 113
" " Deep, Retinned..... 120
" " Shallow, Retinned..... 119
" Tea, Brass.....197–199
" " Copper.....197–198–199
" " Galvanized..... 178
" " Japanned..... 178
" " Retinned.....123–124
" " Tin..... 198
" Wash, Round or Oval..... 180
" Windsor, Retinned..... 118
Knives, Mincing..... 217
Knobs, Damper, Nickel-plated..... 231
" Porcelain..... 232
" Tea Pot, Enameled..... 231
" " Tin..... 161

L

PAGE.

Ladders, Extension..... 242
Ladles, Navy..... 141
" Oyster or Ice, Retinned..... 146
" Pump..... 140
" Retinned.....140-141–142–143
Lamps, Jacket, Japanned..... 170
Lanterns, Giant..... 229
" Police..... 228
" Tubular..... 229
" Universal..... 228
Lead, Pipe..... 299
" Sheet..... 299
" Weight per square foot..... 289
Lifters, Stove..... 192
Lining, Stove, Asbestos..... 250
Lips, Coffee Boiler..... 162

M

PAGE.

Machines, Beading.....38–39
" Cornice..... 73
" Crimping 40–41–42
" Double Seaming, Burton's..... 36
" " " Hurlburt's..... 37
" " " Moore's..... 31
" " " Olmsted's.... 34–35
" " " Stow's.....32–33
" Encased, Burring, Small..... 16
" " " Large..... 16
Machines, Encased, Full Set..... 17
" " Setting Down..... 13
" " Turning, Small..... 15
" " " Large..... 14
" " Wiring..... 12
" Folding, Can Top..... 48
" " Iron Bottom..... 55
" " Roach's..... 56
" " Stow's Improved..... 55
" " Wood Bottom..... 54
" " Wright's..... 54
" Forming 43–44–45–46–47
" " Bail Van Bramer's..... 51
" " Boss..... 51
" " Candlestick..... 49
" " Oval Handle, Jones'..... 50
" " " " Miller's..... 50
" " " " Smith's..... 50
" " Square Box..... 48
" " Tube, Spaulding's..... 52
" " " Stow's..... 53
" " Wire, Bail, Millers..... 49
" " " Ring..... 49
" Fruit Can, Adjustable..... 111
" " " Weitzel's..... 111
" Grooving, Bigelow's Patent..... 9
" " Brass Mounted..... 8
" " Encased..... 8
" Gutter, Haucke's..... 58
" " Iron Bottom..... 59
" " Stow's, Improved..... 57
" Stow's, Patent..... 57
Machines, No. 1, Burring, Small..... 28
" " " Large..... 28
" " Full Set..... 29
" " Setting Down..... 25
" " Turning, Small..... 27
" " " Large..... 26
" " " (Power)..... 30
" " Wiring..... 24
" Raymond's, Burring, Small..... 22
" " " Large..... 22
" " Full Set..... 23
" " Setting Down..... 19
" " Turning, Small..... 21
" " " Large..... 20
" " Wiring..... 18
Machines, Raymond's, Wiring..... 110
" Parts..... 10
" Parts, Encased, Wiring..... 6–7
" " Stow's, Folder.....17–23–29
" Standards..... 74
" Rimming..... 94
" Square Pan..... 94
" " " Miller's..... 94
" " " Whitney's..... 109
" Sundry.....

PAGE.

Machines, Tin Cup..... 73
Mallets..... 102
Mashers, Potato, Retinned..... 149
" " Wire..... 213
Materials, Building, Rules for measuring..... 305
Measures, Graduated..... 196
" Lipped..... 182
" Plain..... 181
Metals, Specific Gravity and Weight of..... 307
Metric System..... 312
Mica..... 254
Mills, Coffee..... 193
Moulds, Cake, Plain..... 152
" " Retinned.....126–127–128
" Candle..... 162
Mouth Pieces, Porcelain..... 207
Mugs, Childrens, Retinned..... 134

N

PAGE.

Nails, Case, Copper..... 233
" Copper..... 233
" Cut, Schedule of Extras..... 297
" Cut, Number to the pound..... 298
" Floor, Brass..... 233
" Slating, Black..... 233
" " Galvanized..... 233
" " Tinned..... 233
" Wire.....266–267
" " Number to the pound..... 296
" Zinc..... 233
Nozzles, Can..... 163
Nozzles and Corks..... 163
Nuts, Cold Pressed, Number to the pound.... 294
Nuts, Forged..... 294

O

PAGE.

Oilers, Brass..... 220
" Copper..... 220
" Mowing Machine..... 220
" Sewing " 220
" Tin, Brass Bottom..... 219
" " Tin Bottom..... 219
" Zinc..... 220

P

PAGE.

Pails, Chamber, Japanned..... 167
" " Seamless, Retinned..... 114
" Dinner..... 181
" Milk..... 181
" " Seamless, Retinned..... 113
" Water, Flaring, Seamless, Retinned.... 114
" " Seamless, Retinned..... 113
Paint, amount required to cover a given surface 305
Paint, Metallic..... 321
Pans, Biscuit, Retinned..... 133
" Bread, Handled, Retinned..... 130
" Cake, Oval..... 130
" " Scolloped, Plain..... 152
" " Tubed, Retinned..... 128
" Candle Mould..... 162
" Cookey, Retinned..... 132
" Corn Cake, Retinned..... 132
" Dairy " 129
" " Plain..... 152
" Dish, Retinned..... 115

PAGE.

Pans, Dish, Oval, Retinned..... 115
" " Pieced..... 180
" Dust, Japanned..... 170
" Fry, Acme..... 190
" " Polished..... 189
" Iron, Oblong, Seamless..... 189
" Iron, Oval..... 188
" Iron, Round, Hammered..... 188
" Iron, Square, Seamless..... 188
" Jelly Cake..... 155
" Kitchen, Retinned..... 116
" Lady Finger, Plain..... 156
" Milk, Plain..... 153
" " Retinned..... 129
" " Flaring, Plain..... 153
" " " Retinned..... 128
" Mixing Retinned..... 116
" Mountain Cake..... 155
" Muffin, Plain..... 156
" " Retinned..... 132
" Oblong, Seamless, Plain..... 152
" Patty..... 157
" Pudding, Oval, Retinned..... 130
" " Plain..... 154
" " Retinned..... 129
" " Strong, Retinned..... 130
" Rinsing, Light, " 115
" Sheet Iron..... 187
" Square, Stamped..... 155
Patterns, Rules for cutting.....270 to 276
Patties, Oyster, Retinned..... 146
Pipe, Block Tin..... 299
" Corrugated Copper..... 234
" " Galvanized..... 234
" Spiral..... 236
Pitchers, Water, Retinned..... 113
Plates, Bakers, Plain..... 154
" Bench..... 85
" Dinner, Retinned..... 131
" Egg, " 132
" " Oval, Retinned..... 131
" Gem..... 155
" Grater..... 161
" Lettered..... 154
" Pie..... 154
" " Lebanon..... 155
" " Scolloped..... 154
" Soup, Retinned..... 131
Pliers, Flat Nose..... 101
" Round Nose..... 101
Plungers, Pump..... 222
Poachers, Egg, Retinned..... 138
Pokers..... 192
Popper's Corn..... 214
Pots, Convex, Seamless, Retinned..... 118
" Tea, Hammered Brass..... 199
" " " Copper..... 199
" " " Tin..... 199
" Tea, Tin..... 182
" Watering, Galvanized..... 197
Presses, Fruit..... 215
Press, Tinners..... 107
Presses, Power.....75–76–77–78
Punch, Rice's..... 72
Punches, Hollow..... 95
" " Self Centering..... 96
" Solid..... 95

R

	PAGE.
Raisers, Bread, Retinned	116
Ranges, Oil	224
Rattles and Whistles	162
Rates of Annual Income of Investments	302
Receipts and Compositions	279 to 285
Recipes, Workshop.	309
Registers	245–246–247–248
Reservoirs, Capacity of	304
Rings, Muffin	162
" Wire	165
Rivets, Brazier's, Copper	262
" Copper, Number to the pound	292
Rivets and Burrs, Copper	262
" " " " Number to pound	292
" " " Iron	256
" Cooper approximate dimensions	294
" Iron in Bulk	255
" Iron, Cooper's	255
" " Hame	255
" " in Papers	256
" " Papers, approximate dimensions	294
" " Trunk	257
" Round Head, number to the pound	295
" Various styles	268
Roaster and Baker	196
Rods, Damper	231
" Gutter Beader	59
" Stove	259
Rolls, Crimping	41
Roofing, Tin, cost per square foot	300–301
Rules, Arithmetical	286

S

	PAGE.
Sadirons	232
Safes, Match, Japanned	169
Saucepans, Beaded, Strong, Retinned	121
" Berlin, Retinned	116
" Convex, Seamless, Retinned	119
" Enameled	176
" Extra Strong, Retinned	120
" Light, Retinned	117
" Pieced, "	119
" Plain	176
" Strong, Retinned	117
" Tinned	176
" Turned	176
" Windsor, Retinned	118
Sauce Pots, Convex "	119
" " Extra Strong	120
" " Windsor	117
Saucers, Retinned	134
Scoops, "	135–136
Scrapers, Stove	192
Screws, Can, Brass	218
" " Tin	218
" " Zinc	218
Seamers, Cross Lock, Burritt's	79
" Lock, Lyon, Conklin & Co	80
" Roofing, Burritt's	81
" " Kenney's	82
Seed, Quantity required to sow a given amount of ground	304
Sets, Rivet	97
Shears, Bench	83
Shears, Circular	84
" Double Cutting, Berridge's	100
" Hand	83–84
Shears and Punch combined	71
" Rotary, Flanders	68
" " Newton's	70
" " Savage's	69
" " Waugh's	71
" Squaring and Slitting	64–65–66–67
" " Stow's, Power	60–61
" " Stow's, Improved	62
" " Wilcox	63
Shovels, Cottage, Japanned	192
" Gem	190
" Iron Clad	191
" Iron Handle	192
" L & G, Tinned	193
" Victor	190
" Wood Handle	192
Sieves, Coal	214
" Flour, Metallic	213
" " Retinned	138
" Jelly, "	138
Sifters, Flour, Crown	214
" " Magic	213
" Sugar, Retinned	146
Skewers, "	143
Skimmers, Flat "	139–140
" Milk, Plain or Pierced	157
" " Retinned	139
" Preserve, Retinned	139
" Vegetable, "	212
Slate, sizes and number to the square	303
Slate Stones	244
Slicers, Egg, Retinned	138
Solder, Brazier's	232
Spiders, Cast Iron	175
Spikes, Cut, number per 100 pounds	298
Spoons	223
Spouts, Can	164
" " Dover	219
" " Engineer	165
" Coffee Pot, Retinned	149
" Tea Kettle, Copper	200
" " Pot, Fancy, Retinned	149
Spout Guards	209
Stakes, Tinners, Bath Tub	91
" " Beakhorn	87
" " Bevel Edge, Square	89
" " Blowhorn	87
" " Bottom	89
Stakes, Tinners' Candle Mould	87
" " Conductor	91
" " Coppersmiths' Square	89
" " Creasing	87
" " Creasing with Horn	89
" " Double Seaming	89
" " " " with 4 heads	92
" " Hollow Mandrel	92
" " Hatchet	89
" " Mandrel	91
" " Needle Case	87
" " Round Head	91
" " Solid, Mandrel	92
" " Square	87
" " Tea Kettle	92
Stands, Wire, Tea or Coffee Pot	213

PAGE.

Steel Plates, weight per square foot.....287–288
" Tempering.....305–306
Stew Pans, Deep, Retinned..... 121
" " Oyster " 122
" " Shallow " 121
Stoves, Lamp..... 224
" Oil.....225–226–227
Stove Pipe, Embossed..... 244
Stop Motions, Fillingor..... 216
Strainers, Gravy, Plain..... 182
" Gravy, Retinned.....137–138
" Milk, " 144
" Wire Handle..... 211
" Wire, Tea or Coffee..... 211
" Wood Handle..... 211
Strings, Wax..... 253
Swedges, Creasing..... 93
" Cullender..... 93
" Square Pan..... 93

T

PAGE.

Tables, Weights and Measures....309–310–311–312
Tacks, Copper..... 333
Tacks, Iron, number to the pound..... 298
Taggers, Iron..... 297
" Tin..... 297
Tanks, sizes and contents..... 304
Terne Plates, stock sizes..... 297
Tin, Perforated..... 164
Tin Plate, stock sizes..... 296
Tinned Sheets, stock sizes..... 297
Tinware, sizes expressed in form of frustrum of a cone..... 277
Toasters, Wire..... 212
Toilet Sets, Japanned..... 172
Tongs, Clamp..... 99
" Crimping..... 41
" Gutter..... 99
" Roofing..... 99
" Roofing, Adjustable, Reese's..... 100
Tools, full set..... 88
Tortumas, Retinned..... 134
Trays, Cash Box, Japanned..... 168
" Child's " 171
" Metallic..... 219
" Tea, Japanned..... 171
Trough Eave five feet long..... 241
" " eight feet long..... 239
T's & Y's Galvanized..... 235
Tubes, Funnel..... 161

PAGE.

Tubes and Tips, Candlemould..... 162
Tube, Speaking..... 209
Tumblers, Retinned, Seamless..... 134
Turners, Cake, Retinned..... 147
" " Steel..... 216

U

PAGE.

Urns, Copper..... 200

V

PAGE.

Valves, Pump..... 222–223
Ventilators, Stationary, Moore's..... 237
" Revolving, Buckeye..... 238
Vises, Parallel..... 102

W

PAGE.

Weight and Specific Gravity of a cubic foot of various substances.....308
Weight of Various Articles..... 307
Whips, Egg, Retinned..... 139
Whistles, Speakiug Tube.....207–208
Wire, Brass and Copper..... 262
" Cast Steel..... 261
" Coppered..... 261
" Galvanized..... 261
" Gun Screw..... 261
" Iron, Bright and Annealed..... 260
Wires, Pointed..... 259
Wire Tinned..... 261
" on Spools..... 251
" Brass, weight per lineal foot.....287–288
" Copper, " " " 287–288
" Iron, " " " 287–288
" Steel, " " " 287–288
" Expressed in Fractions of an Inch..... 290
" Iron, size, weight, length and strength 290
Wood, Comparative Value of, for fuel..... 305
Wringers, Clothes..... 201

Y

PAGE.

Y's and T's, Galvanized..... 235

Z

PAGE.

Zinc, Plates, weight per square foot 289
" Sheet, " " " " 295
" To Polish..... 295

Patterson & White, Prs., Philada.